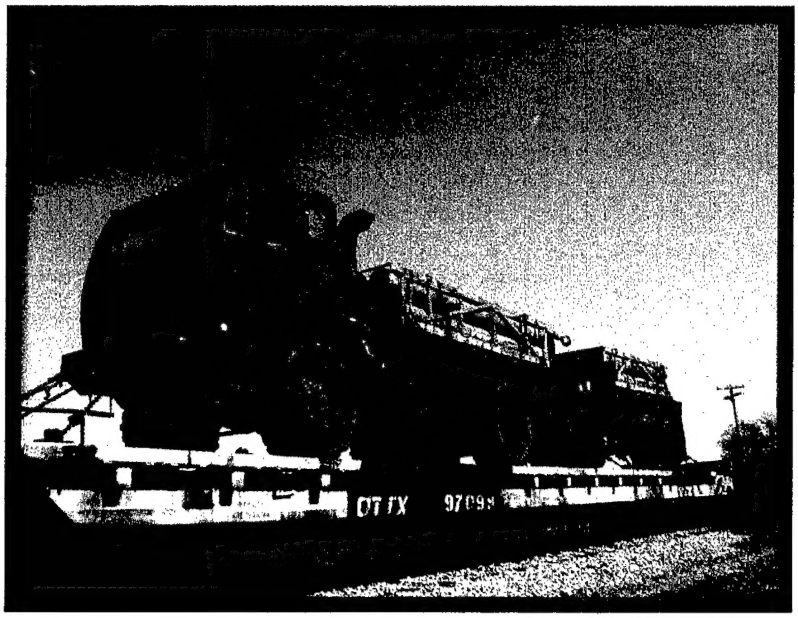
FINAL REPORT
MAY 2003

REPORT NO. 02-19 (A)

HIMARS RESUPPLY VEHICLE AND TRAILER TP-94-01, "TRANSPORTABILITY TESTING PROCEDURES"



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MCALESTER, OKLAHOMA 74501-9053

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REPORT NO. 02-19 (A) **MAY 2003**
HIMARS RESUPPLY VEHICLE AND TRAILER
TP-94-01, REV. 1, JULY 2002 "TRANSPORTABILITY TESTING PROCEDURES"

ABSTRACT

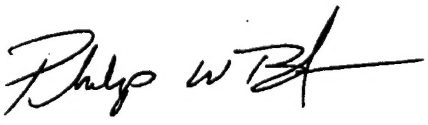
The U.S. Army Defense Ammunition Center (DAC), Validation Engineering Division (SJMAC-DEV), was tasked by the Precision Fire Rocket and Missile System Project Management Office, Huntsville, Alabama, to conduct transportability testing using the High Mobility Artillery Rocket System (HIMARS) Resupply Vehicle (RSV) and Resupply Trailer (RST) when loaded with Multiple Launch Rocket System (MLRS) rocket pods. Loading procedures specified in AMC Drawing 19-48-8152 were used as a guideline. The testing was conducted in accordance with TP-94-01, Revision 1, July 2003 "Transportability Testing Procedures."

The HIMARS Resupply Vehicle and Resupply Trailer were tested in accordance with TP-94-01, Revision 1, July 2002. The primary area of concern was with the lateral movement of the pods during current and previous testing. The results of the movement were that the straps loosened during rail impact testing. The brackets " shoes" are laterally too far apart. Therefore, we recommend that the lateral distance between the "shoes" be reduced.

Also, the RSV and RST are currently equipped with 8-D handles each. During testing the forward most and rearward most rings on each side were used. Therefore, we recommend that four D handles, the second handles in from each corner, be eliminated.

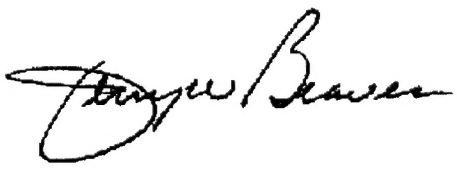
Therefore, the HIMARS RSV and RST, as tested, are satisfactory to transport ammunition.

Prepared by:



PHILIP W. BARICKMAN
Lead Validation Engineer

Reviewed by:



JERRY W. BEAVER
Chief, Validation Engineering Division

U.S. ARMY DEFENSE AMMUNITION CENTER

VALIDATION ENGINEERING DIVISION
MCALESTER, OK 74501-9053

REPORT NO. 02-19 (A)

HIMARS Resupply Vehicle (RSV) and Resupply Trailer (RST)
TP-94-01, Revision 1, July 2002 "Transportability Testing Procedures"

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PART 1 – INTRODUCTION

A. BACKGROUND. The U.S. Army Defense Ammunition Center (DAC), Validation Engineering Division (SJMAC-DEV), was tasked by the Precision Fire Rocket and Missile System Project Management Office, Huntsville, Alabama, to conduct transportability testing using the HIMARS Resupply Vehicle (RSV) and Resupply Trailer (RST) when loaded with rocket pods. Loading procedures specified in AMC Drawing 19-48-8152 were used as a guideline. The testing was conducted in accordance with TP-94-01, Revision 1, July 2002, "Transportability Testing Procedures."

B. AUTHORITY. This test was conducted IAW mission responsibilities delegated by the U.S. Army Joint Munitions Command (JMC), Rock Island, IL. Reference is made to the following:

1. AR 740-1, 15 June 2001, Storage and Supply Activity Operation.

2. OSC-R, 10-23, Mission and Major Functions of U.S. Army Defense Ammunition Center (DAC) 21 Nov 2000.

C. OBJECTIVE. The objective of the testing was to validate if the HIMARS RSV and RST, manufactured by Stewart and Stevenson, satisfied the transportability requirements of TP-94-01, Revision 1, July 2002.

D. CONCLUSION. The HIMARS Resupply Vehicle and Resupply Trailer were tested in accordance with TP-94-01, Revision 1, July 2002. The primary area of concern was with the lateral movement of the pods during current and previous testing. The results of the movement were that the straps loosened during rail impact testing. The brackets " shoes" are laterally too far apart. Therefore, we recommend that the lateral distance between the "shoes" be reduced.

Also, the RSV and RST are currently equipped with 8-D handles each. During testing the forward most and rearward most rings on each side were used. Therefore, we recommend that four D handles, the second handles in from each corner, be eliminated.

Therefore, the HIMARS RSV and RST, as tested, are satisfactory to transport ammunition.

PART 2 - ATTENDEES

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(586) 574-8873

US Army Tank-automotive &
Armaments Command
PM-MTV, Engineering
ATTN: AMSTA-TR-E/MTV/MS 500
Warren, MI 48397

PART 3 - TEST EQUIPMENT

1. Truck, Cargo: MTV, HIMARS Resupply, M1084A1
Manufactured by: Stewart and Stevenson
Tactical Vehicle Systems Division
Sealy, TX 77474
MFG Serial No.: C-015393BFGK
MFG Date: 08/01
Maximum Payload: 5 tons
Empty Weight: 24,420 pounds
Gross Weight: 35,147 pounds

2. Trailer Cargo, 5 ton: MTV, M1095
Manufactured by: Stewart and Stevenson
Tactical Vehicle Systems Division
Sealy, TX 77474
NSN: 2330 01 449 1776
MFG Serial No.: TM-014431BFCK
MFG Date: 04/01
Maximum Payload: 5 tons
Curb Weight Total: 9,520 pounds
Gross Weight: 19,520 pounds

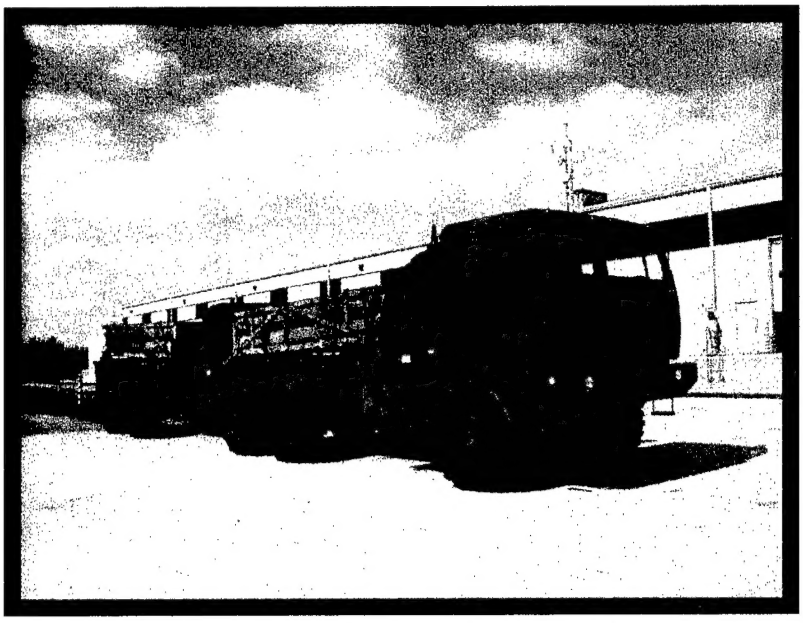


Photo 1. HIMARS RSV and RST

3. Dynometer
Manufactured by: John Chatillion & Son New York, New York
Model: TD-5
Serial No. 6226
Range: 0-10,000 lbs.
Calibration Date: 1 May 2002

PART 4 - TEST PROCEDURES

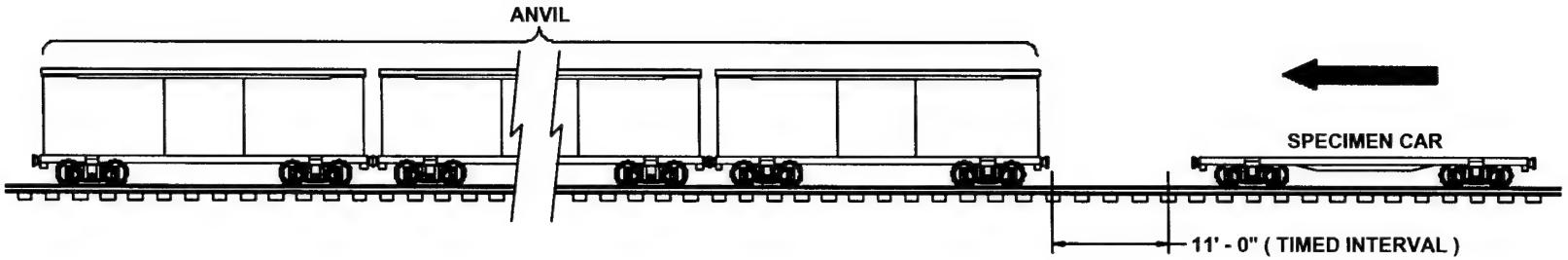
The test procedures outlined in this section were extracted from TP-94-01, "Transportability Testing Procedures," Revision 1, July 2003, for validating tactical vehicles and outloading procedures used for shipping munitions by tactical or commercial truck, railcar, and ocean-going vessel.

Inert (non-explosive) items will be used to build the load. The test loads will be prepared using the blocking and bracing procedures proposed for use with munitions (***see Part 7 for procedures***). The weight and physical characteristics (weights, physical dimensions, center of gravity, etc.) of the test loads will be similar to live (explosive) ammunition.

A. RAIL TEST. RAIL IMPACT TEST METHOD. The test load or vehicle will be secured to a flatcar. The equipment needed to perform the test will include the specimen (hammer) car, four empty railroad cars connected together to serve as the anvil, and a railroad locomotive. The anvil cars will be positioned on a level section of track with air and hand brakes set and with draft gears compressed. The locomotive unit will push the specimen car toward the anvil at a predetermined speed, then disconnect from the specimen car approximately 50 yards away from the anvil cars allowing the specimen car to roll freely along the track until it strikes the anvil. This will constitute an impact. Impacting will be accomplished at speeds of 4, 6, and 8.1 mph in one direction and at a speed of 8.1 mph in the reverse direction. The speeds will have a tolerance of plus .5 mph and minus zero mph. The impact speeds will be determined by using an electronic counter to measure the time for the specimen car to traverse an 11-foot distance immediately prior to contact with the anvil cars (see Figure 1).

ASSOCIATION OF AMERICAN RAILROADS (AAR)

STANDARD TEST PLAN



4 BUFFER CARS (ANVIL) WITH DRAFT GEAR COMPRESSED AND AIR BRAKES IN A SET POSITION

ANVIL CAR TOTAL WT. 250,000 LBS (APPROX)

SPECIMEN CAR IS RELEASED BY SWITCH ENGINE TO ATTAIN:

IMPACT NO. 1 @ 4 MPH
IMPACT NO. 2 @ 6 MPH
IMPACT NO. 3 @ 8.1 MPH

THEN THE CAR IS REVERSED AND RELEASED BY SWITCH ENGINE TO ATTAIN:

IMPACT NO. 4 @ 8.1 MPH

Figure 1. Rail Impact Sketch

B. ON/OFF ROAD TESTS.

1. HAZARD COURSE. The test load or vehicle will be transported over the 200-foot-long segment of concrete-paved road consisting of two series of railroad ties projecting 6 inches above the level of the road surface. The hazard course will be traversed two times (see Figure 2).

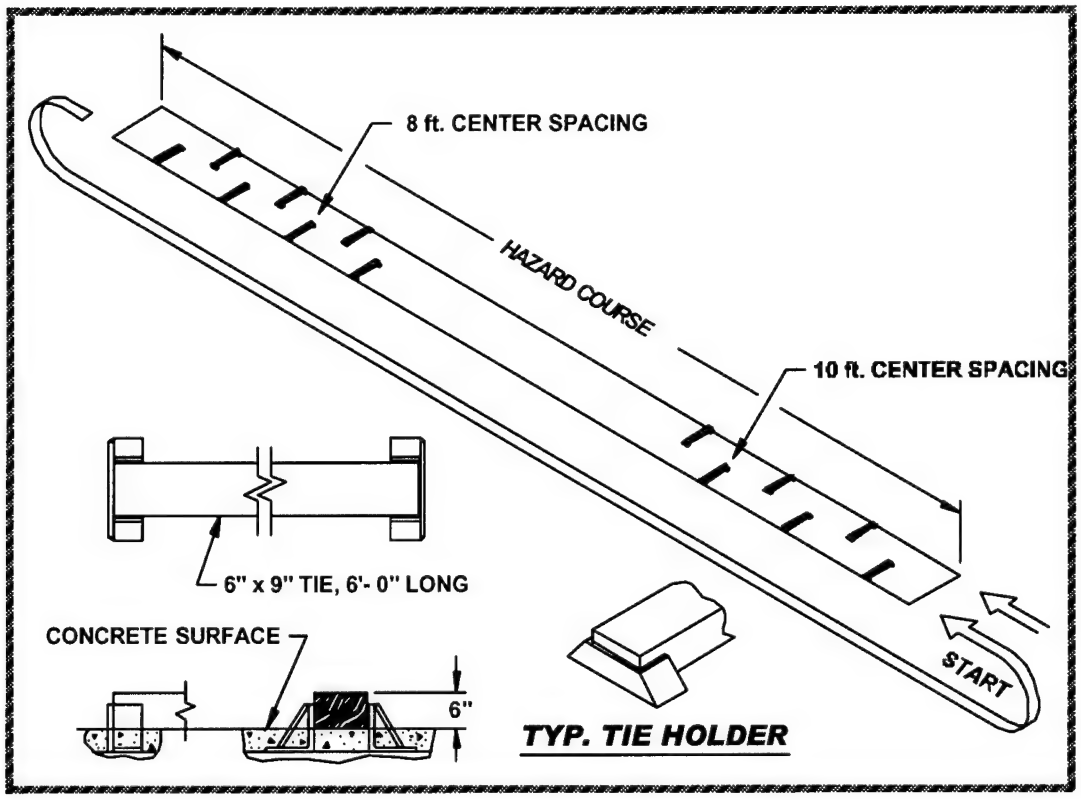


Figure 2. Hazard Course Sketch

a. The first series of 6 ties are spaced on 10-foot centers and alternately positioned on opposite sides of the road centerline for a distance of 50 feet.

b. Following the first series of ties, a paved roadway of 75 feet separates the first and second series of railroad ties.

c. The second series of 7 ties are spaced on 8-foot centers and alternately positioned on opposite sides of the road centerline for a distance of 50 feet.

d. The test load is driven across the hazard course at speeds that will produce the most violent vertical and side-to-side rolling reaction obtainable in traversing the hazard course (approximately 5 mph).

2. ROAD TRIP. The test load or vehicle will be transported for a distance of 30 miles over a combination of roads surfaced with gravel, concrete, and asphalt. The test route will include curves, corners, railroad crossings and stops and starts. The test load or vehicle will travel at the maximum speed for the particular road being traversed, except as limited by legal restrictions.

3. PANIC STOPS. During the road trip, the test load or vehicle will be subjected to three (3) full airbrake stops while traveling in the forward direction and one in the reverse direction while traveling down a 7 percent grade. The first three stops are at 5, 10, and 15 mph while the stop in the reverse direction is approximately 5 mph. This testing will not be required if the Rail Impact Test is performed.

4. WASHBOARD COURSE. The test load or vehicle will be driven over the washboard course at a speed that produces the most violent response in the vertical direction.

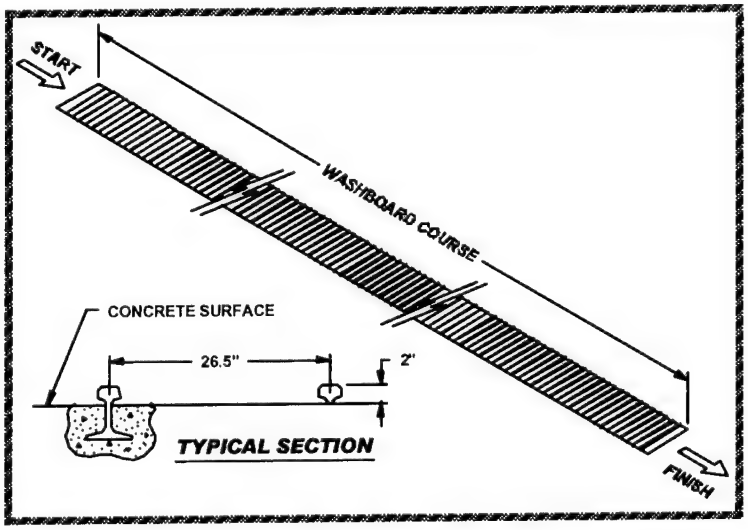


Figure 3. Washboard Course Sketch

PART 5 - TEST RESULTS

5.1 HIMARS RSV and RST with Full Payload.

Payload Weight: RSV - 10,530 pounds

RST - 10,495 pounds

Testing Date: 8 April 2003

A. RAIL TEST.

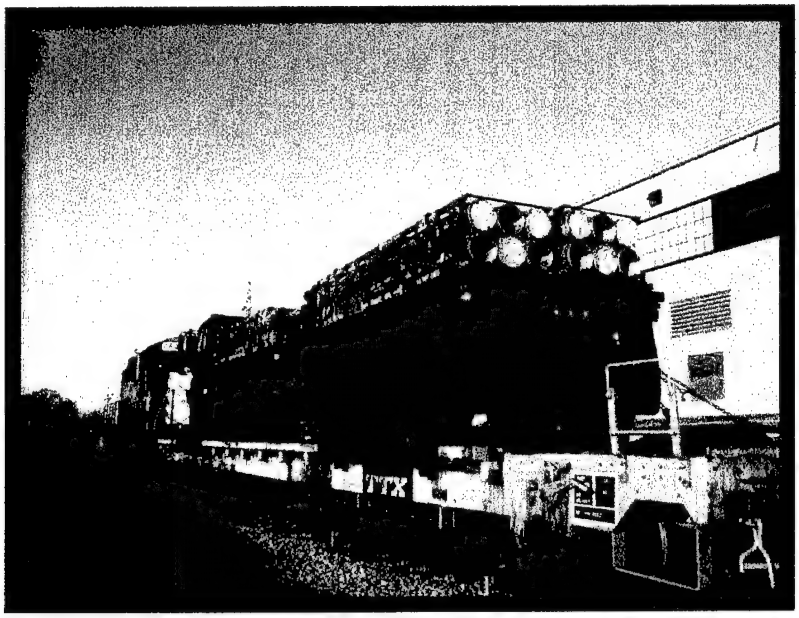


Photo 2. Rail Impact Testing of HIMARS RSV and RST.

Description	Weight
Flatcar Number: OTTX 97099	68,100 lbs.
HIMARS Resupply Vehicle and Resupply Trailer with full payload	55,920 lbs.
Total Specimen Wt.	124,020 lbs.
Buffer Car (four cars)	257,900 lbs.

Figure 4.

Remarks: Figure 4 lists the test components and weights of the items used during the Rail Impact Tests.

Impact Number	Avg. Velocity (mph)
1	3.4
2	4.3
3	6.2
4	8.2
5	8.1

Figure 5.

Remarks:

1. Figure 5 lists the average speeds of the specimen car immediately prior to impact with the anvil. Impact #1 was determined to be a "no test" due to the inadequate impact speed (minimum 4 mph). Impact #5 is the reverse impact.
2. Following Impact #2 the payload moved 0.25 inches in the direction of impact on the trailer (toward the rear of the trailer) on both the passenger and driver's side of the trailer. The payload on the truck moved 1.25-1.5 inches in the direction of impact (toward the rear of the truck) on the vehicle.
3. Following Impacts #3 and #4 there was no additional movement of the payload.
4. Following Impact #5 the payload moved 0.75 inches on the truck and 0.5 inches on the trailer, in the direction of impact. The payload moved on the

vehicle passenger side 0.37 inches laterally toward the driver's side following Impact #5. The strap located at the rear of the truck on the driver's side loosened due to the brackets " shoes" are too far apart laterally.

B. ON/OFF ROAD TESTS.

1. HAZARD COURSE.

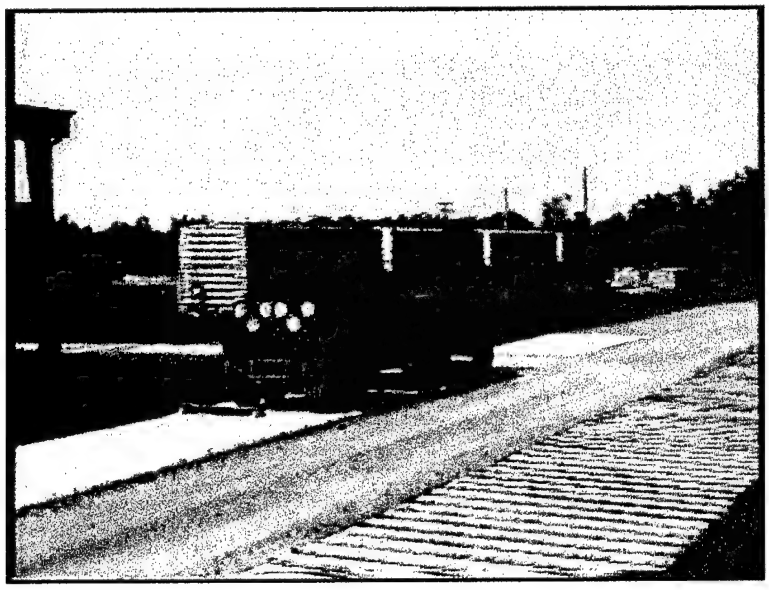


Photo 3. Example of Hazard Course Testing of the HIMARS RSV and RST

Pass No.	Elapsed Time	Avg. Velocity (mph)
1	34 Seconds	4.3
2	23 Seconds	6.3

Figure 6.

Remarks:

1. Figure 6 lists the average speeds of the test load through the Hazard Course.
2. Inspection following Passes #1 and #2 revealed no excessive movement of the payload, damage to the truck, trailer, tiedowns, and straps.

2. **ROAD TRIP**: Inspection revealed no damage or excessive movement of the payload or damage to the truck, trailer, tiedowns or straps.

3. **PANIC STOPS**: Testing was not required since the HIMARS RSV and RST were rail impact tested.

4. **HAZARD COURSE:**

Pass No.	Elapsed Time	Avg. Velocity (mph)
3	22 Seconds	6.6
4	24 Seconds	6.0

Figure 7.

Remarks:

1. Figure 7 lists the average speeds of the test load through the Hazard Course.
2. Inspection following Passes #3 and #4 revealed no excessive movement of the payload, damage to the truck, trailer, tiedowns, and straps.
3. Passes #3 and #4 were conducted following the Road Trip.

5. **WASHBOARD COURSE**: Inspection revealed no damage or excessive movement of the payload or damage to the truck, trailer, tiedowns, or straps.

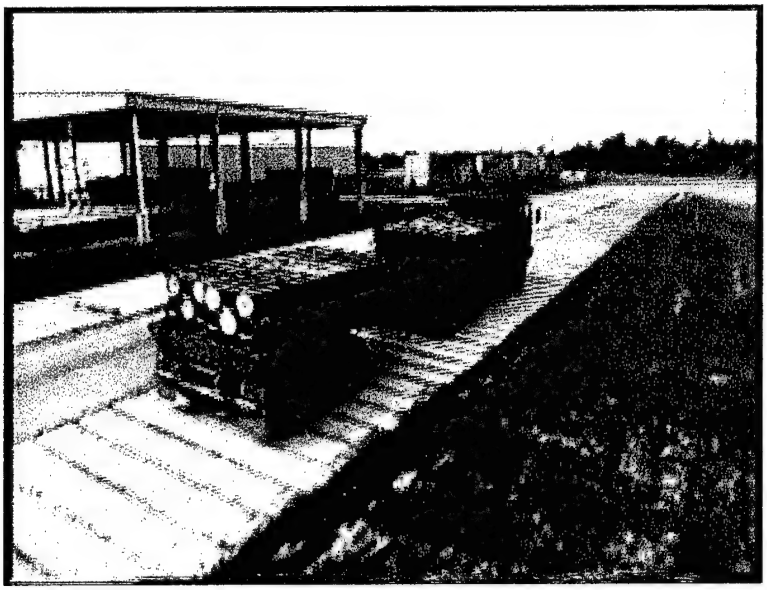


Photo 4. Example of Washboard Course Testing of HIMARS RSV and RST

C. <u>CONCLUSION:</u> The HIMARS RSV and RST performed adequately during testing. Therefore, the HIMARS RSV and RST, as tested, are adequate for the transport of ammunition. The lateral movement of the pods during rail impact testing is an area of concern. The results of the movement were that the straps loosened during rail impact testing. The brackets " shoes" are laterally too far apart. Therefore, we recommend that the lateral distance between the "shoes" be reduced.

5.2 HIMARS RSV and RST with Half Payload

Payload Weight: RSV – 5,275 pounds

RST – 5,265 pounds

Testing Date: 9 April 2003

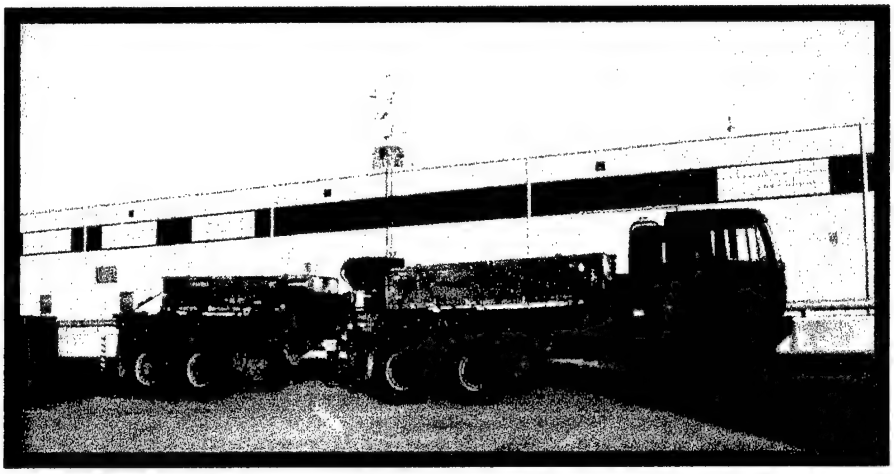


Photo 5. Single Pod Payload on RSV and RST.

A. ON/OFF ROAD TESTS.

1. HAZARD COURSE.

Photo 6. Example of Hazard Course Testing of RSV and RST.

Pass No.	Elapsed Time	Avg. Velocity (mph)
1	22 Seconds	6.6
2	30 Seconds	4.8

Figure 8.

Remarks:

1. Figure 8 lists the average speeds of the test load through the Hazard Course.
2. Inspection following Passes #1and #2 revealed no excessive movement of the payload, damage to the truck, trailer, tiedowns or straps.

2. ROAD TRIP: Inspection revealed no damage or excessive movement of the payload or damage to the truck, trailer, tiedowns, or straps.

3. PANIC STOPS: Inspection revealed no damage or excessive movement of the payload or damage to the truck, trailer, tiedowns, or straps.

4. HAZARD COURSE:

Pass No.	Elapsed Time	Avg. Velocity (mph)
3	28 Seconds	5.2
4	26 Seconds	5.6

Figure 9.

Remarks:

1. Figure 9 lists the average speeds of the test load through the Hazard Course.
2. Inspection following Passes #3 and #4 revealed no excessive movement of the payload, damage to the truck, trailer, tiedowns, or straps.
3. Passes #3 and #4 were conducted following the road trip.

5. WASHBOARD COURSE: Inspection revealed no damage or excessive movement of the payload or damage to the truck, trailer, tiedowns, or straps.

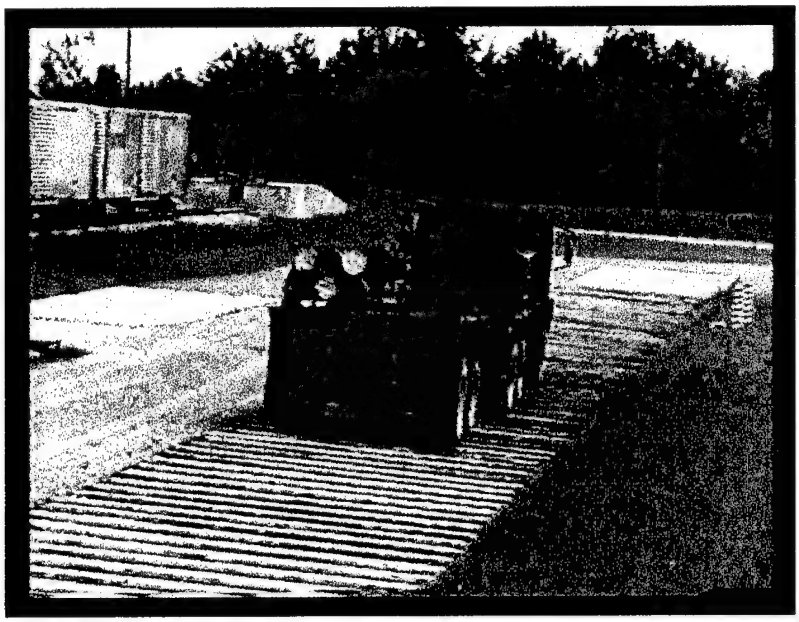


Photo 7. Example of Washboard Course testing of HIMARS RSV and RST.

B. CONCLUSION: No damage or excessive movement of the payload or damage to the truck, trailer, tiedowns, or straps occurred during testing. Therefore, the HIMARS RSV and RST, as tested, are adequate for the transport of ammunition.

5.3 HIMARS RSV and RST Ring Pull Test

Testing Date: 10 April 2003

A. PULL TESTING: The pull testing was conducted on the D handle on the front driver's side of the RSV and RST. The testing was conducted in the vertical direction and at the resultant angle of 35 degrees lateral and 49 degrees longitudinal. The pull was 5000 pounds and was held a minimum of 6 seconds.

Remarks: Inspection following each test revealed no visible deformation to the D handles or area around the D handles.

B. CONCLUSION: The D handle tie-down provisions, as currently designed, are adequate to be used for ammunition transportation.

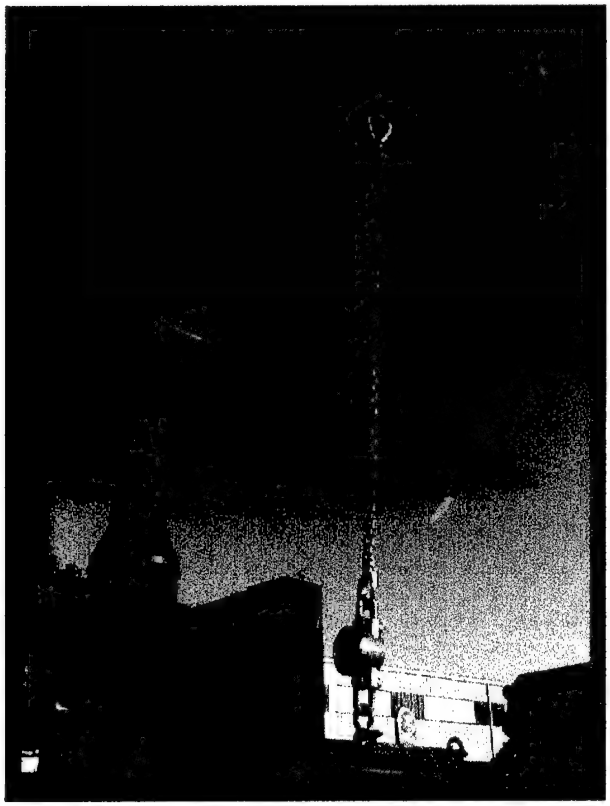


Photo. 8 D Handle Testing on RSV.

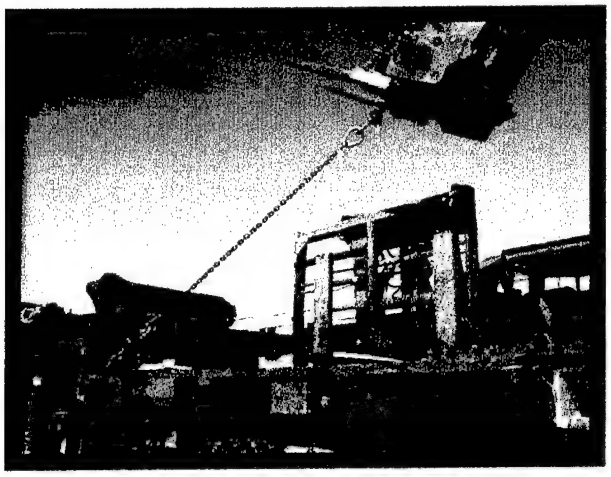


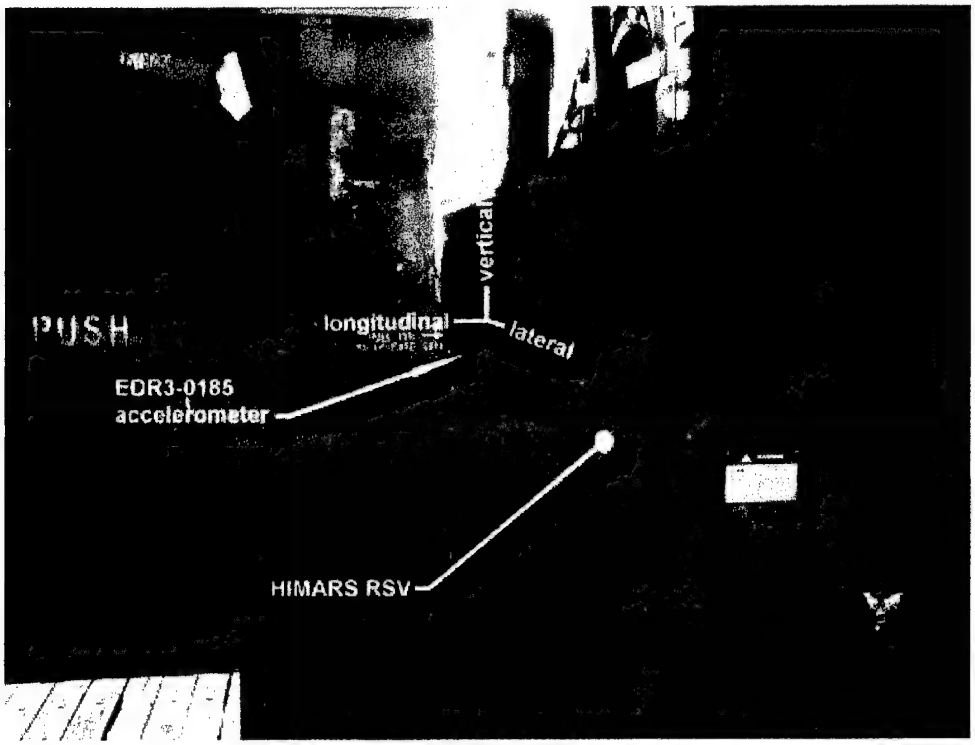
Photo. 9 D Handle Testing on RST.

PART 6 – ACCELEROMETER DATA

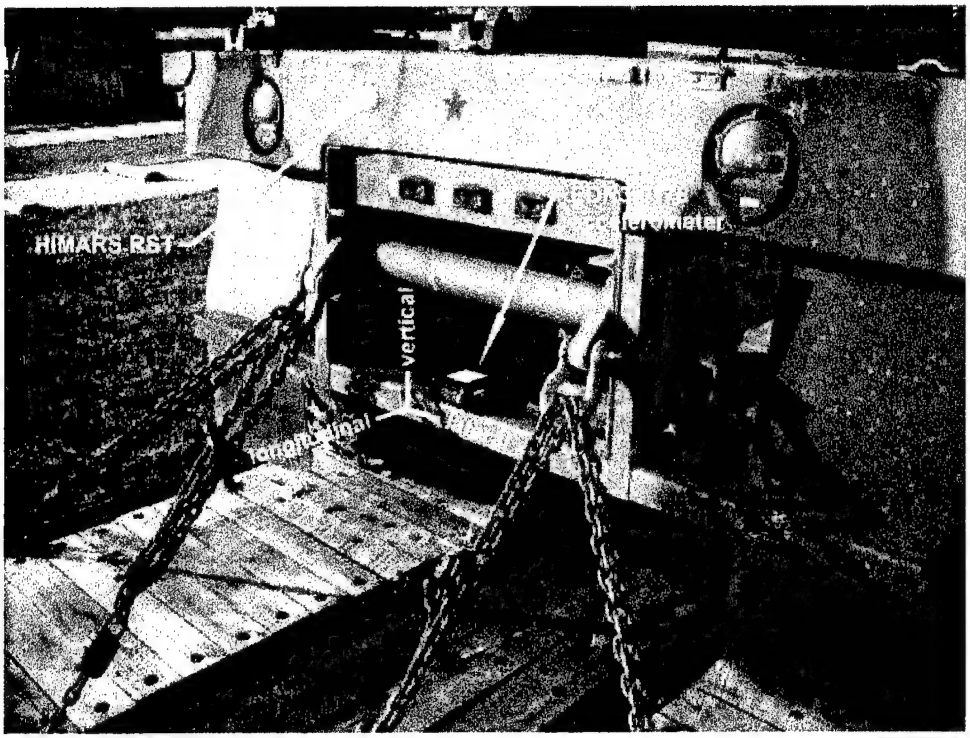
The first accelerometers were located in various areas on the test specimen. These areas are described on each of the following graphic depictions of each of the railcar impacts, hazard course, road course, and washboard course. The axial orientation of the accelerometers is as follows:

A table depicting the identification and location of the graphic illustrations is below: (Sensors were located on the RSV and RST as shown below).

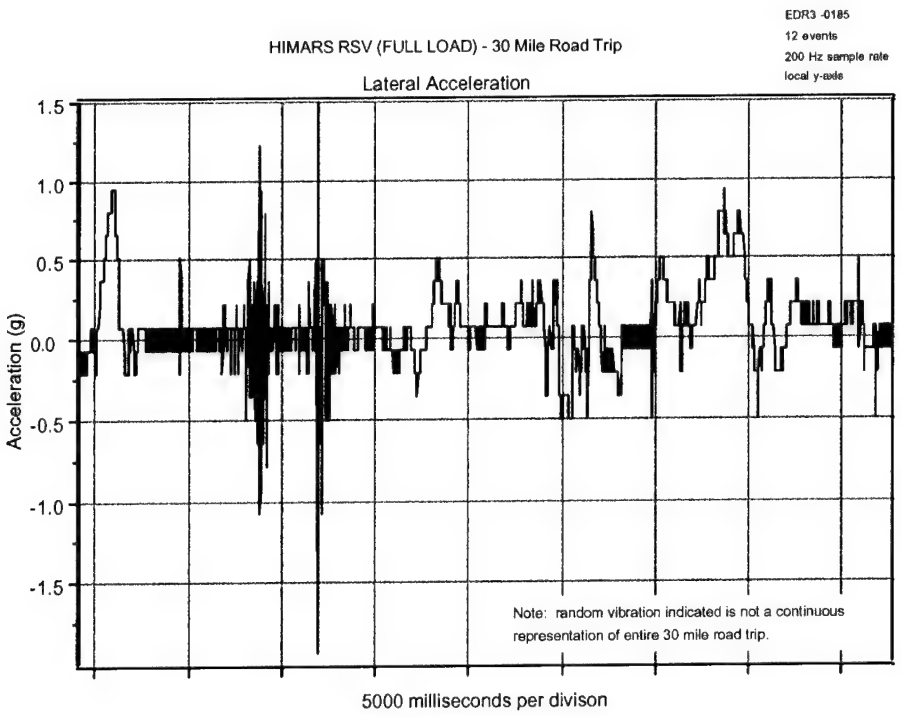
HIMARS RSV/RST			
FULL PAYLOAD	PAGE	HALF PAYLOAD	PAGE
Rail Impact-RSV	No Data		
Rail Impact-RST	No Data		
Hazard Course – Pass #1 – RSV Lateral	No Data	Hazard Course – Pass #1 – RSV Lateral	6-16
Hazard Course – Pass #1 – RSV Longitudinal	No Data	Hazard Course – Pass #1 – RSV Longitudinal	6-16
Hazard Course – Pass #1 – RSV Vertical	No Data	Hazard Course – Pass #1 – RSV Vertical	6-17
Hazard Course – Pass #1 – RST Lateral	No Data	Hazard Course – Pass #1 – RST Lateral	6-17
Hazard Course – Pass #1 – RST Longitudinal	No Data	Hazard Course – Pass #1 – RST Longitudinal	6-18
Hazard Course – Pass #1 – RST Vertical	No Data	Hazard Course – Pass #1 – RST Vertical	6-18
Hazard Course – Pass #2 – RSV Lateral	No Data	Hazard Course – Pass #2 – RSV Lateral	6-19
Hazard Course – Pass #2 – RSV Longitudinal	No Data	Hazard Course – Pass #2 – RSV Longitudinal	6-19
Hazard Course – Pass #2 – RSV Vertical	No Data	Hazard Course – Pass #2 – RSV Vertical	6-20
Hazard Course – Pass #2 – RST Lateral	No Data	Hazard Course – Pass #2 – RST Lateral	6-20
Hazard Course – Pass #2 – RST Longitudinal	No Data	Hazard Course – Pass #2 – RST Longitudinal	6-21
Hazard Course – Pass #2 – RST Vertical	No Data	Hazard Course – Pass #2 – RST Vertical	6-21
Road Trip – RSV Lateral	6-4	Road Trip – RSV Lateral	6-22
Road Trip – RSV Longitudinal	6-4	Road Trip – RSV Longitudinal	6-22
Road Trip – RSV Vertical	6-5	Road Trip – RSV Vertical	6-23
Road Trip – RST Lateral	6-5	Road Trip – RST Lateral	6-23
Road Trip – RST Longitudinal	6-6	Road Trip – RST Longitudinal	6-24

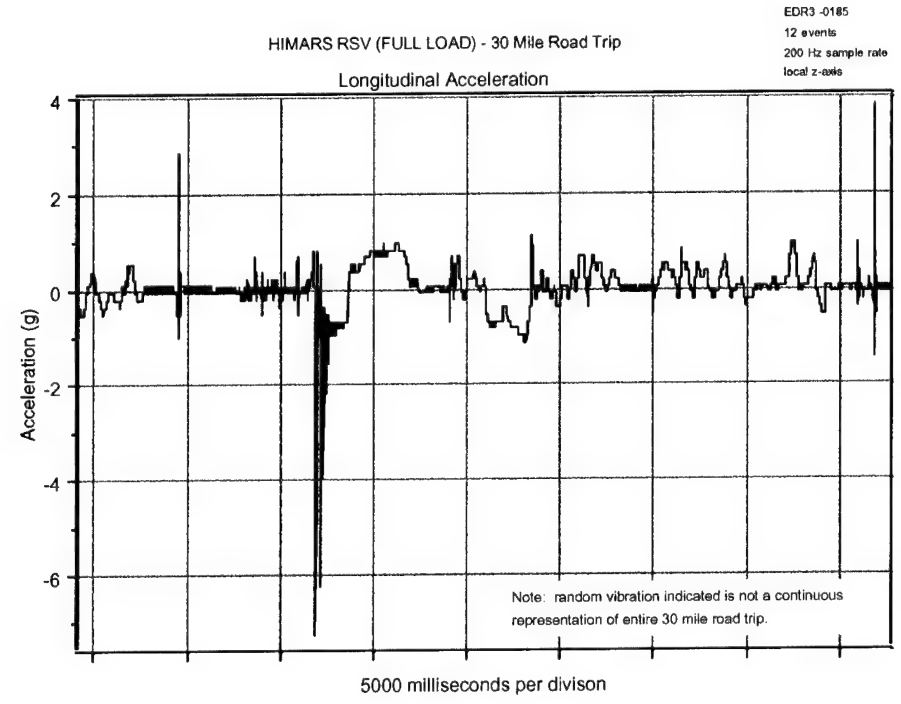


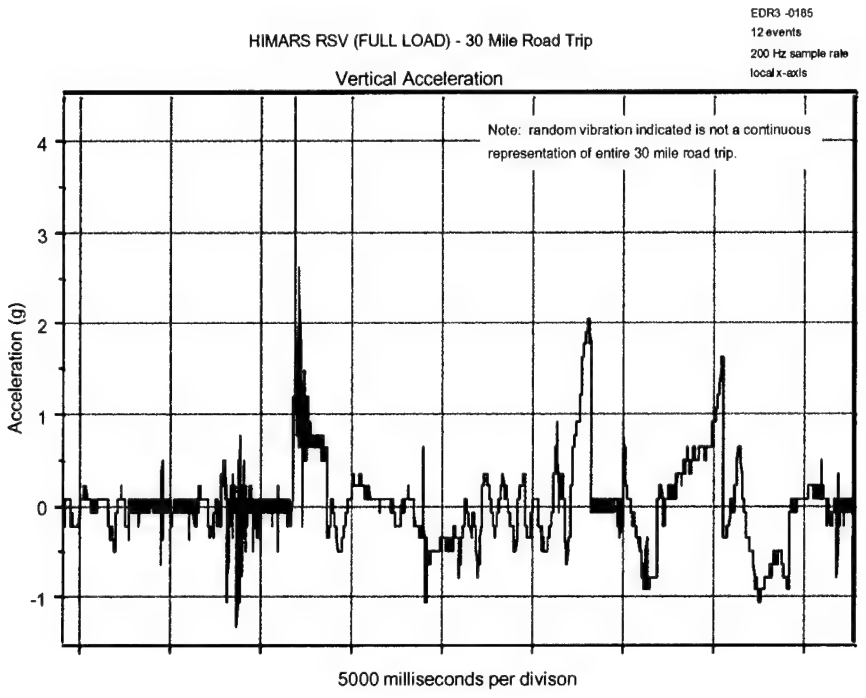
RSV Sensor Location

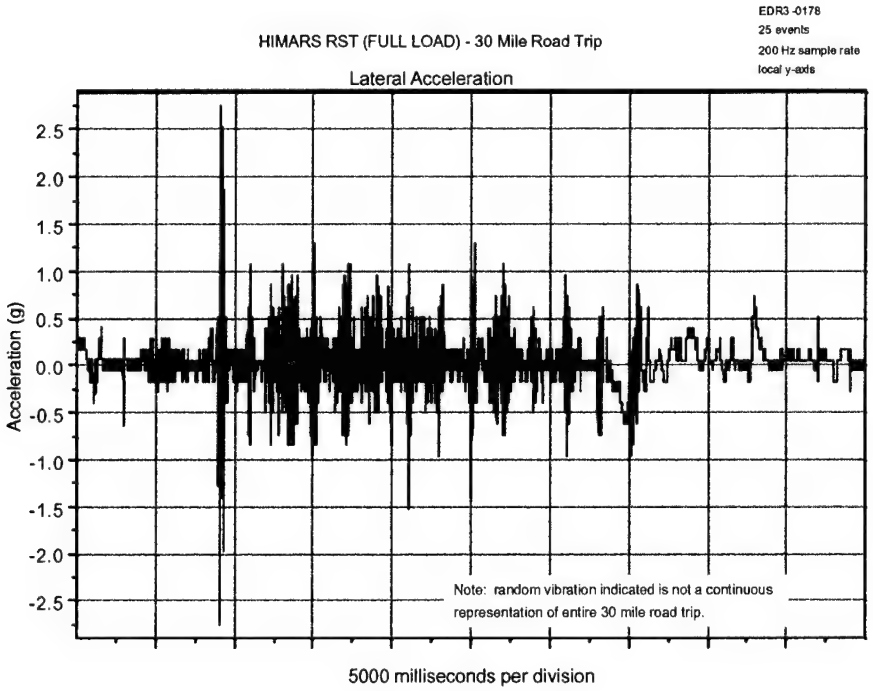


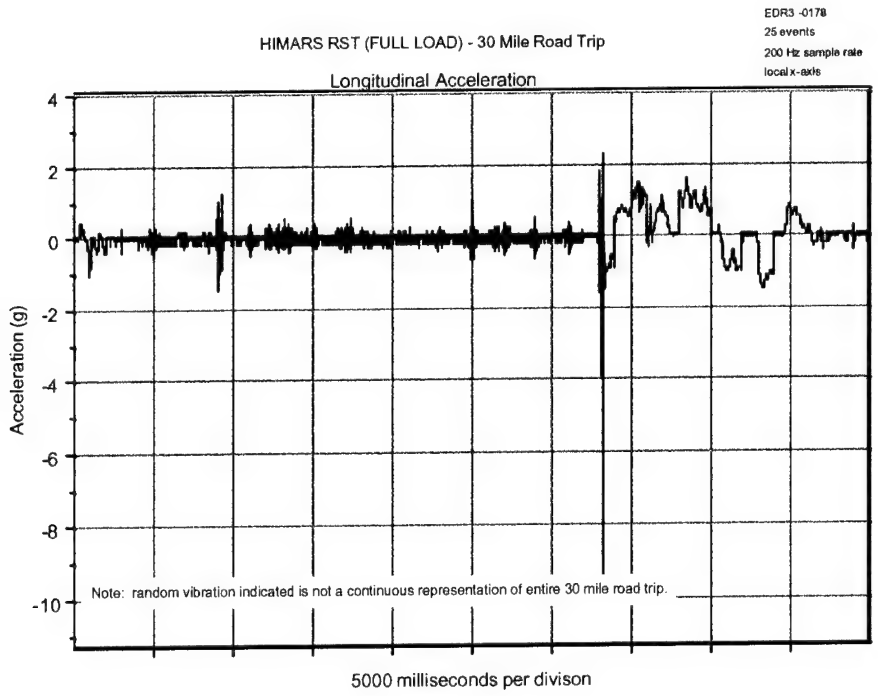
RST Sensor Location

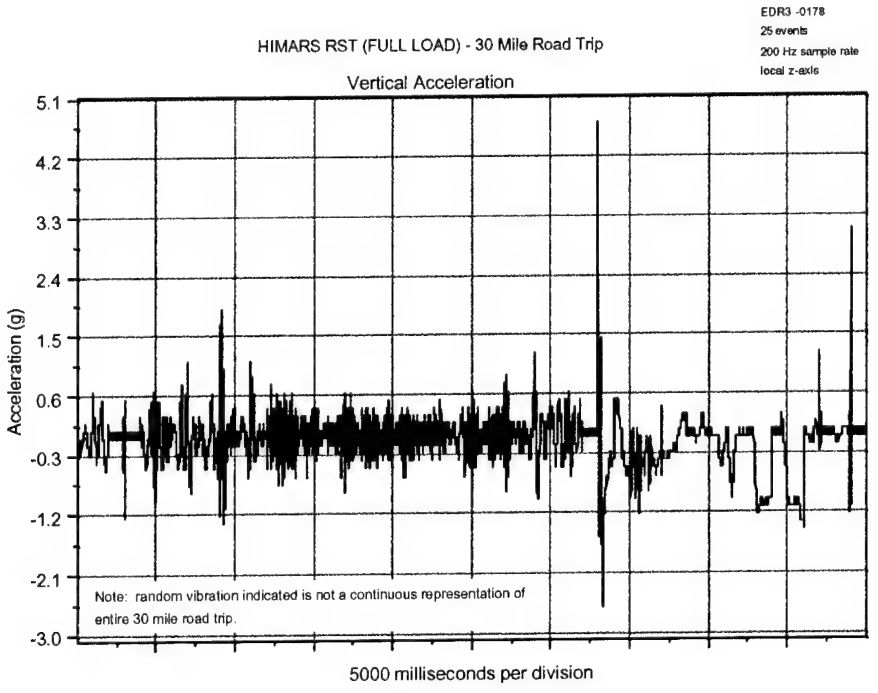

EDR3 -0185
12 events
200 Hz sample rate
local y-axis
HIMARS RSV (FULL LOAD) - 30 Mile Road Trip
Lateral Acceleration
1.5
1.0
0.5
0.0
-0.5
-1.0
-1.5
Acceleration (g)
Note: random vibration indicated is not a continuous representation of entire 30 mile road trip.
5000 milliseconds per divison

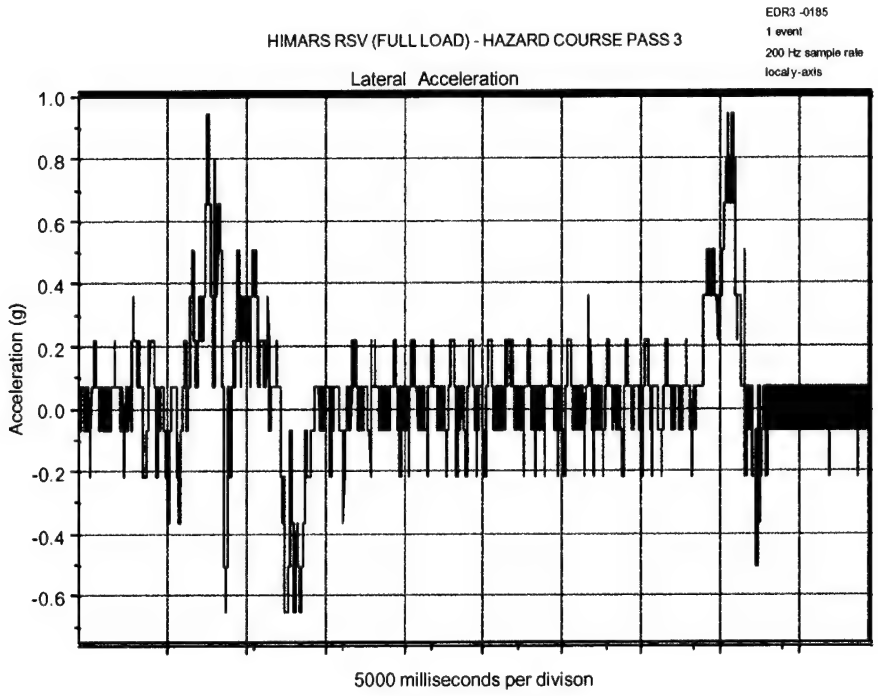

EDR3 -0185
12 events
200 Hz sample rate
local z-axis
HIMARS RSV (FULL LOAD) - 30 Mile Road Trip
Longitudinal Acceleration
4
2
0
-2
-4
-6
Acceleration (g)
Note: random vibration indicated is not a continuous representation of entire 30 mile road trip.
5000 milliseconds per divison

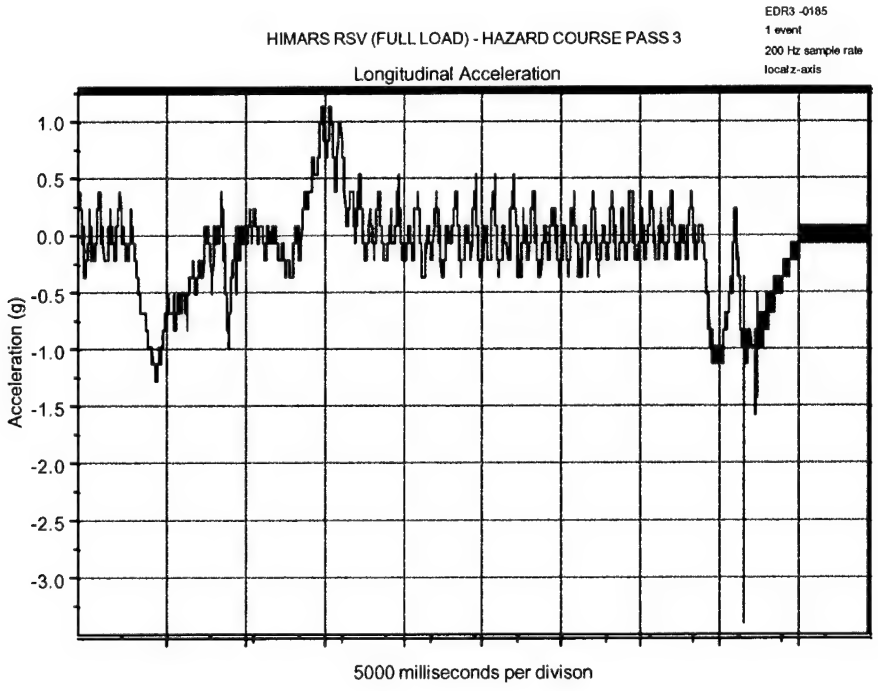

EDR3 -0185
12 events
200 Hz sample rate
local x-axis
HIMARS RSV (FULL LOAD) - 30 Mile Road Trip
Vertical Acceleration
Note: random vibration indicated is not a continuous representation of entire 30 mile road trip.
Acceleration (g)
4
3
2
1
0
-1
5000 milliseconds per divison

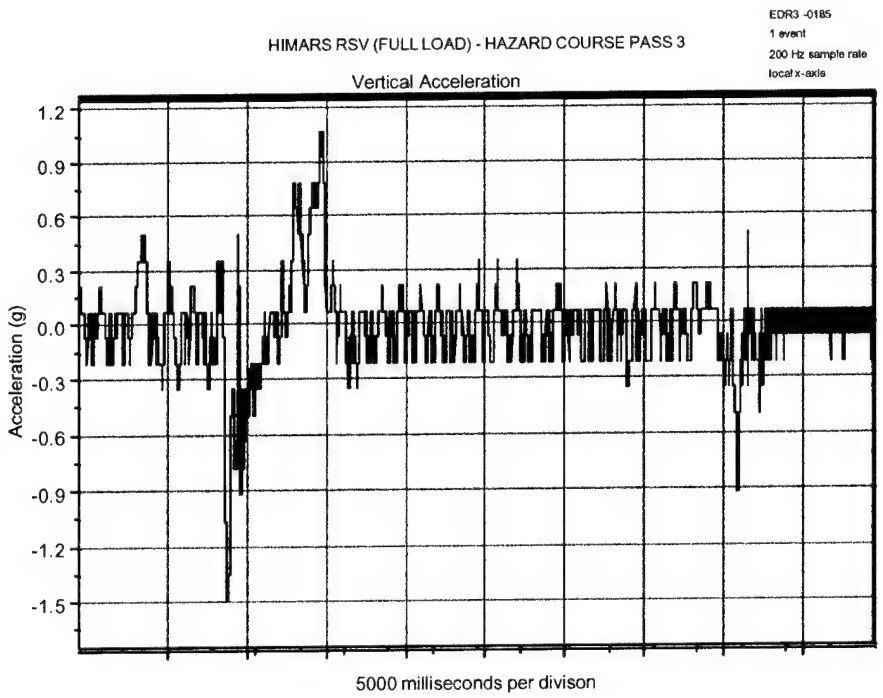

EDR3 -0178
25 events
200 Hz sample rate
local y-axis
HIMARS RST (FULL LOAD) - 30 Mile Road Trip
Lateral Acceleration
Acceleration (g)
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
Note: random vibration indicated is not a continuous representation of entire 30 mile road trip.
5000 milliseconds per division

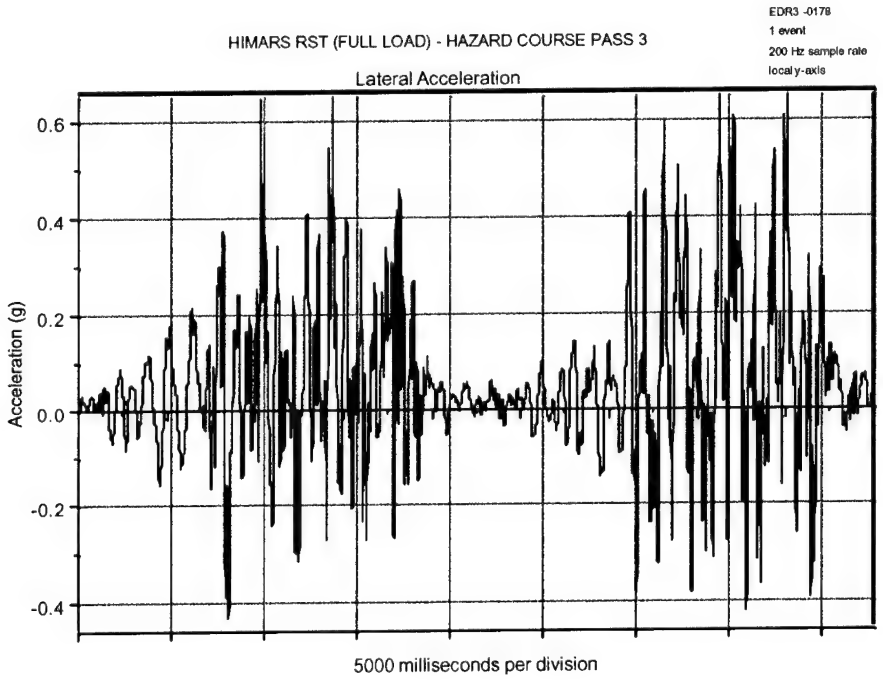

EDR3 -0178
25 events
200 Hz sample rate
local x-axis
HIMARS RST (FULL LOAD) - 30 Mile Road Trip
Longitudinal Acceleration
4
2
0
-2
-4
-6
-8
-10
Acceleration (g)
Note: random vibration indicated is not a continuous representation of entire 30 mile road trip.
5000 milliseconds per divison

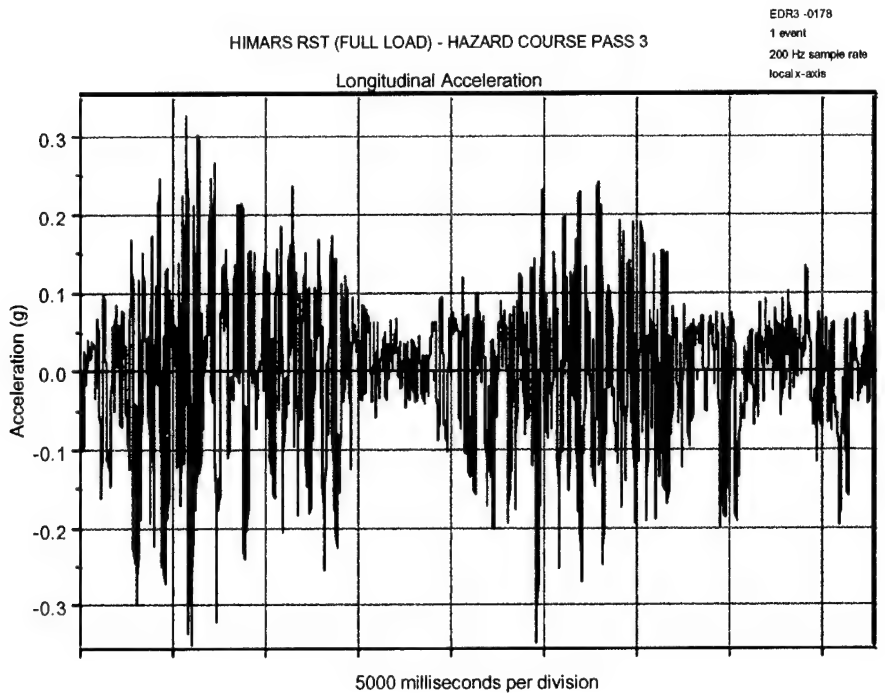

EDR3 -0178
25 events
200 Hz sample rate
local z-axis
HIMARS RST (FULL LOAD) - 30 Mile Road Trip
Vertical Acceleration
5.1
4.2
3.3
2.4
1.5
0.6
-0.3
-1.2
-2.1
-3.0
Acceleration (g)
Note: random vibration indicated is not a continuous representation of entire 30 mile road trip.
5000 milliseconds per division

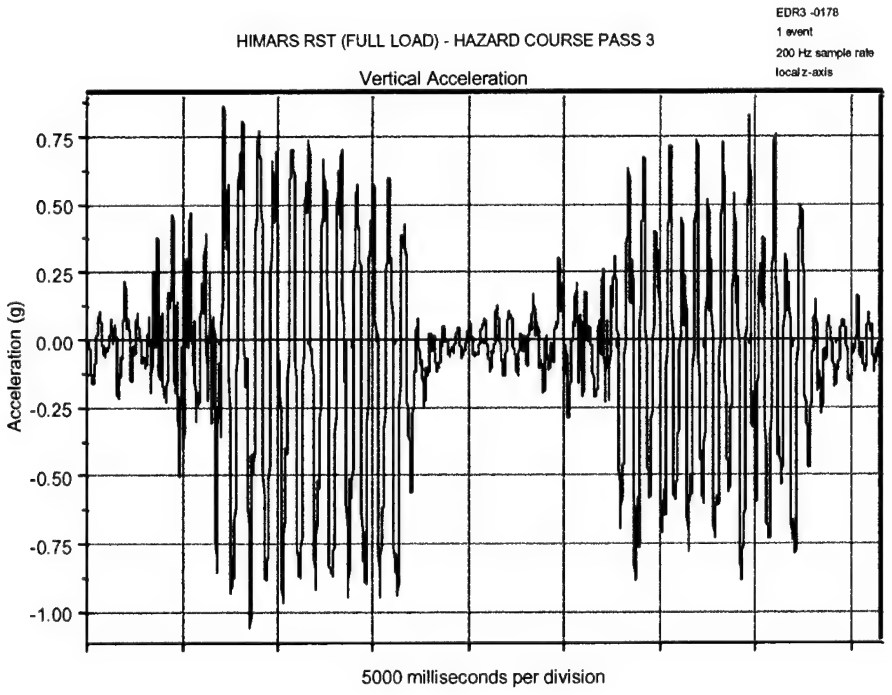

EDR3 -0185
1 event
200 Hz sample rate
local y-axis
HIMARS RSV (FULL LOAD) - HAZARD COURSE PASS 3
Lateral Acceleration
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
-0.4
-0.6
Acceleration (g)
5000 milliseconds per divison

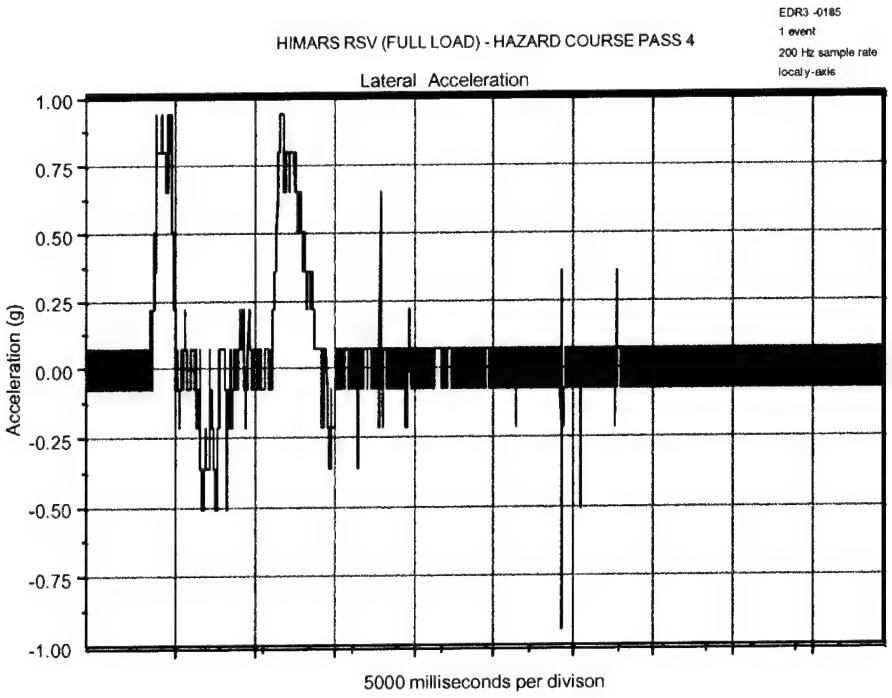

EDR3 -0185
1 event
200 Hz sample rate
local z-axis
HIMARS RSV (FULL LOAD) - HAZARD COURSE PASS 3
Longitudinal Acceleration
1.0
0.5
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
-3.0
Acceleration (g)
5000 milliseconds per divison

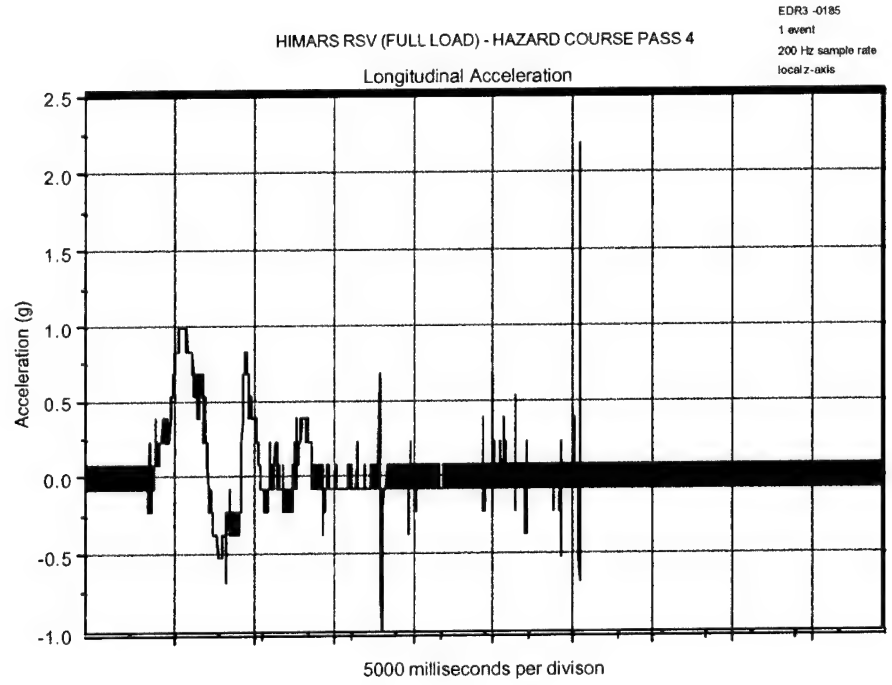

EDR3 -0185
1 event
200 Hz sample rate
local x-axis
HIMARS RSV (FULL LOAD) - HAZARD COURSE PASS 3
Vertical Acceleration
1.2
0.9
0.6
0.3
0.0
-0.3
-0.6
-0.9
-1.2
-1.5
Acceleration (g)
5000 milliseconds per divison

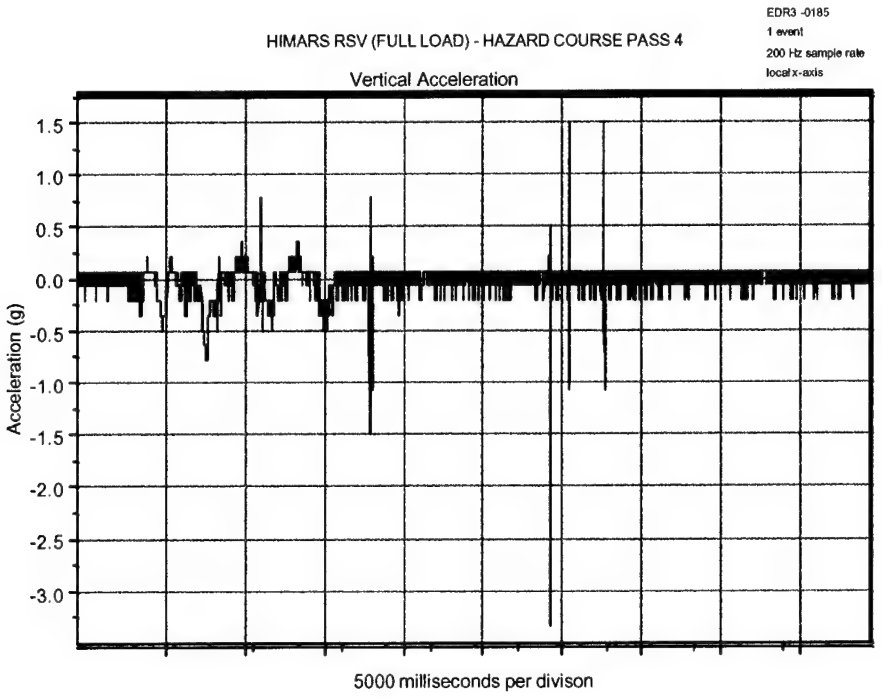

EDR3 -0178
1 event
200 Hz sample rate
local y-axis
HIMARS RST (FULL LOAD) - HAZARD COURSE PASS 3
Lateral Acceleration
0.6
0.4
0.2
0.0
-0.2
-0.4
Acceleration (g)
5000 milliseconds per division

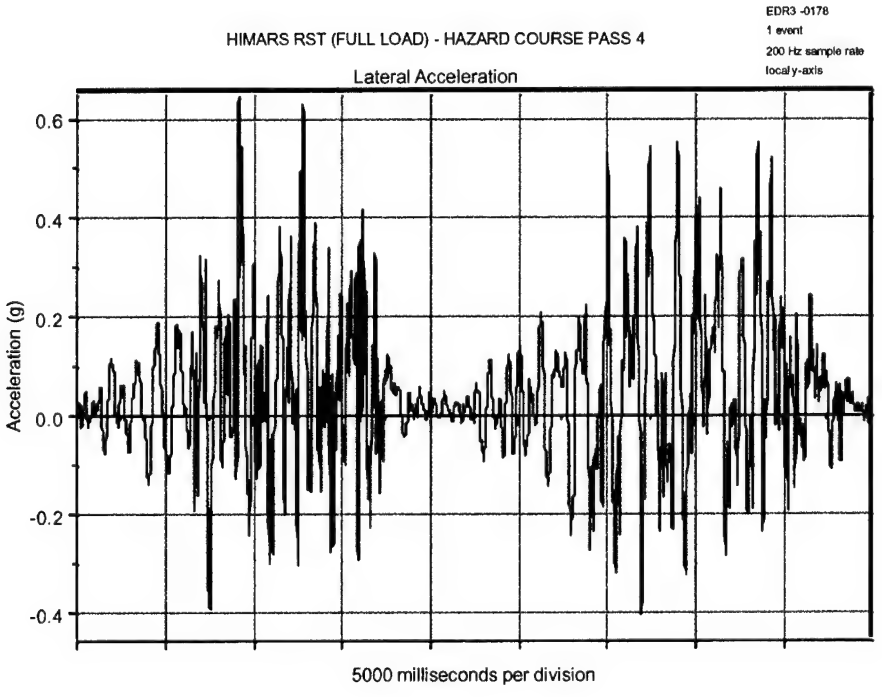

EDR3 -0178
1 event
200 Hz sample rate
local x-axis
HIMARS RST (FULL LOAD) - HAZARD COURSE PASS 3
Longitudinal Acceleration
0.3
0.2
0.1
0.0
-0.1
-0.2
-0.3
Acceleration (g)
5000 milliseconds per division

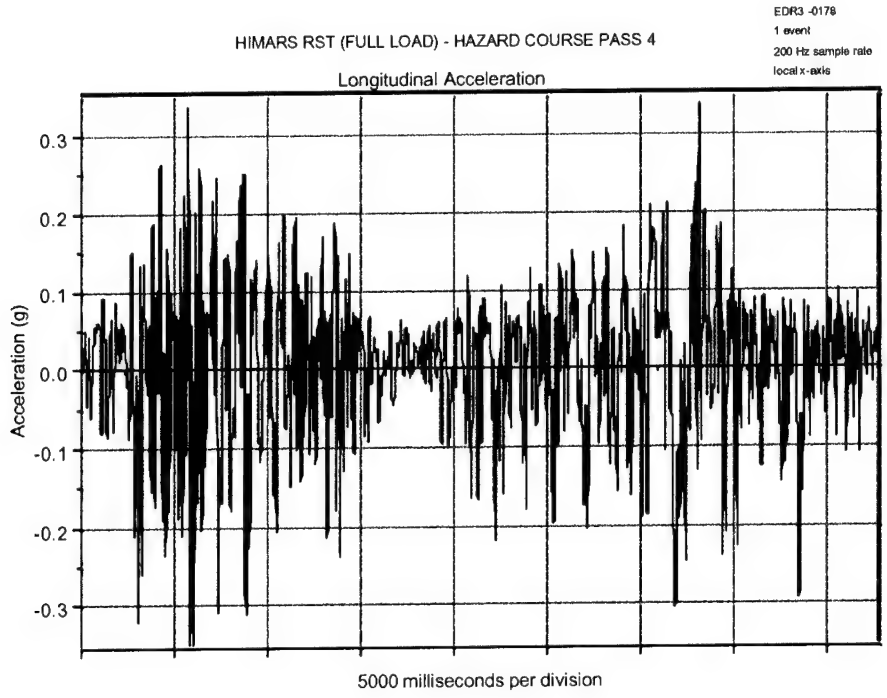

EDR3 -0178
1 event
200 Hz sample rate
local z-axis
HIMARS RST (FULL LOAD) - HAZARD COURSE PASS 3
Vertical Acceleration
0.75
0.50
0.25
0.00
-0.25
-0.50
-0.75
-1.00
Acceleration (g)
5000 milliseconds per division

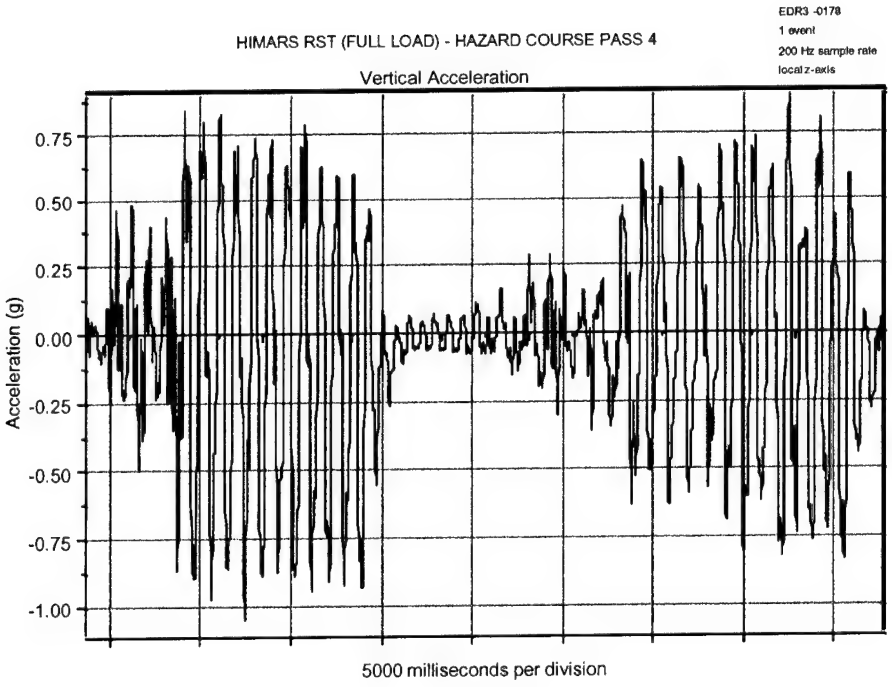

EDR3 -0185
1 event
200 Hz sample rate
local y-axis
HIMARS RSV (FULL LOAD) - HAZARD COURSE PASS 4
Lateral Acceleration
1.00
0.75
0.50
0.25
0.00
-0.25
-0.50
-0.75
-1.00
Acceleration (g)
5000 milliseconds per divison


EDR3 -0185
1 event
200 Hz sample rate
local z-axis
HIMARS RSV (FULL LOAD) - HAZARD COURSE PASS 4
Longitudinal Acceleration
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
Acceleration (g)
5000 milliseconds per divison

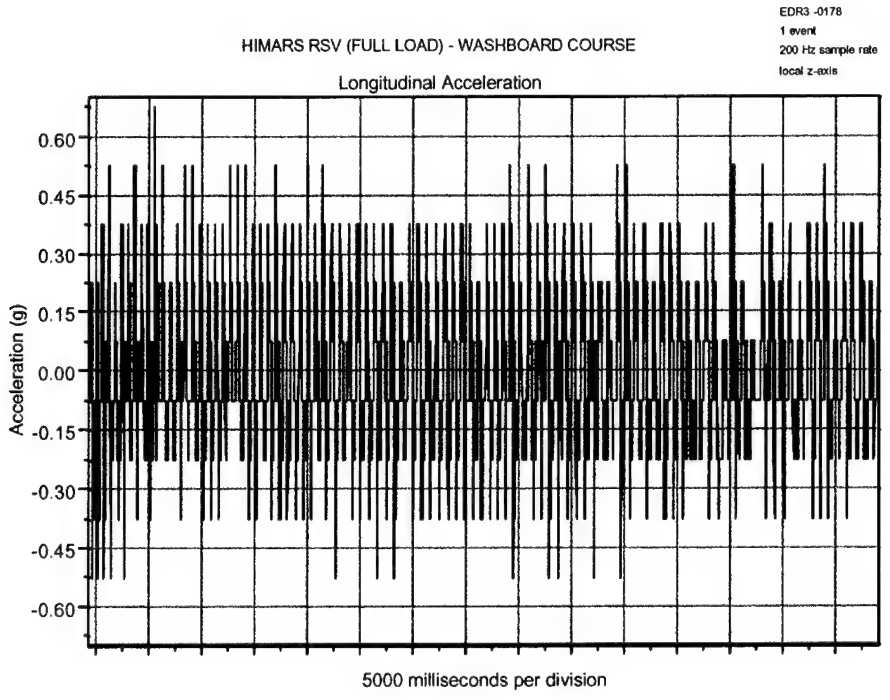

EDR3 -0185
1 event
200 Hz sample rate
local x-axis
HIMARS RSV (FULL LOAD) - HAZARD COURSE PASS 4
Vertical Acceleration
1.5
1.0
0.5
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
-3.0
Acceleration (g)
5000 milliseconds per divison

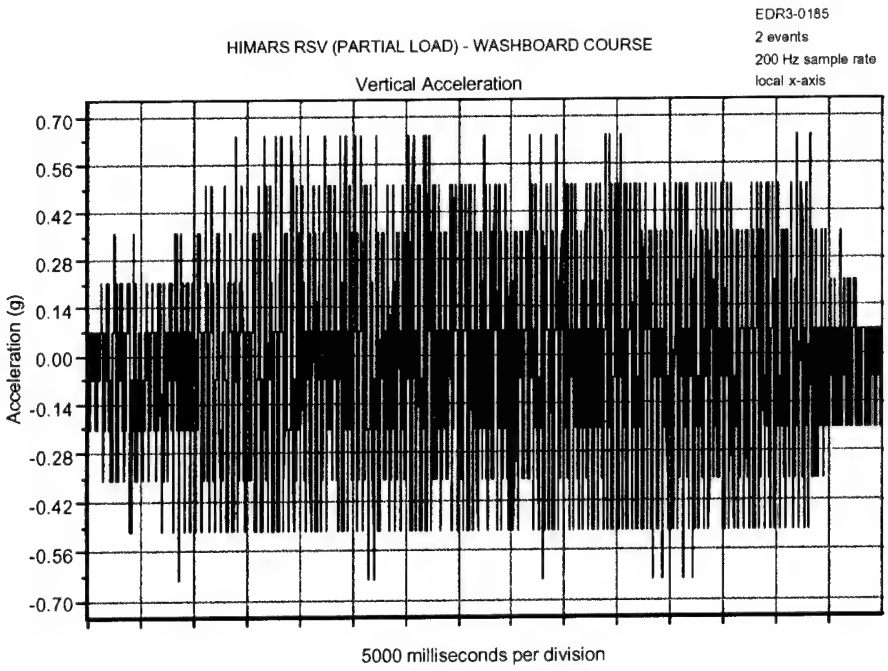

EDR3 -0178
1 event
200 Hz sample rate
local y-axis
HIMARS RST (FULL LOAD) - HAZARD COURSE PASS 4
Lateral Acceleration
0.6
0.4
0.2
0.0
-0.2
-0.4
Acceleration (g)
5000 milliseconds per division

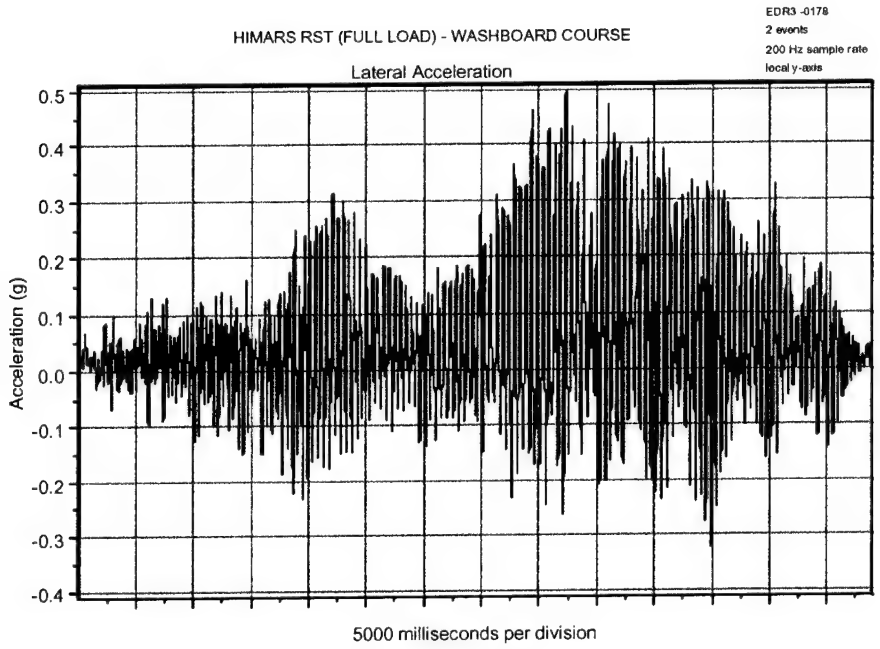

EDR3 -0178
1 event
200 Hz sample rate
local x-axis
HIMARS RST (FULL LOAD) - HAZARD COURSE PASS 4
Longitudinal Acceleration
0.3
0.2
0.1
0.0
-0.1
-0.2
-0.3
Acceleration (g)
5000 milliseconds per division

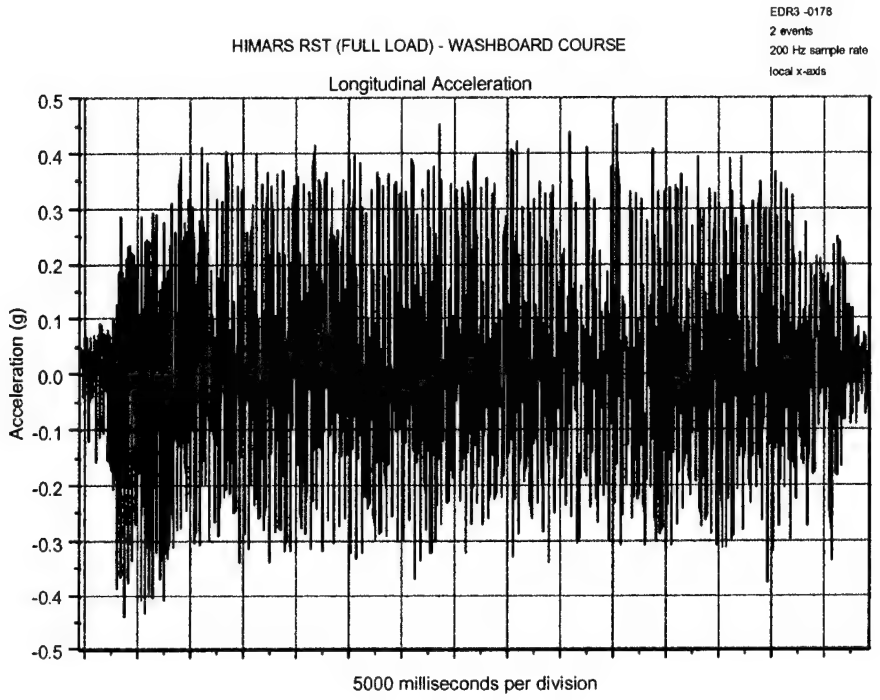

EDR3 -0178
1 event
200 Hz sample rate
local z-axis
HIMARS RST (FULL LOAD) - HAZARD COURSE PASS 4
Vertical Acceleration
0.75
0.50
0.25
0.00
-0.25
-0.50
-0.75
-1.00
Acceleration (g)
5000 milliseconds per division

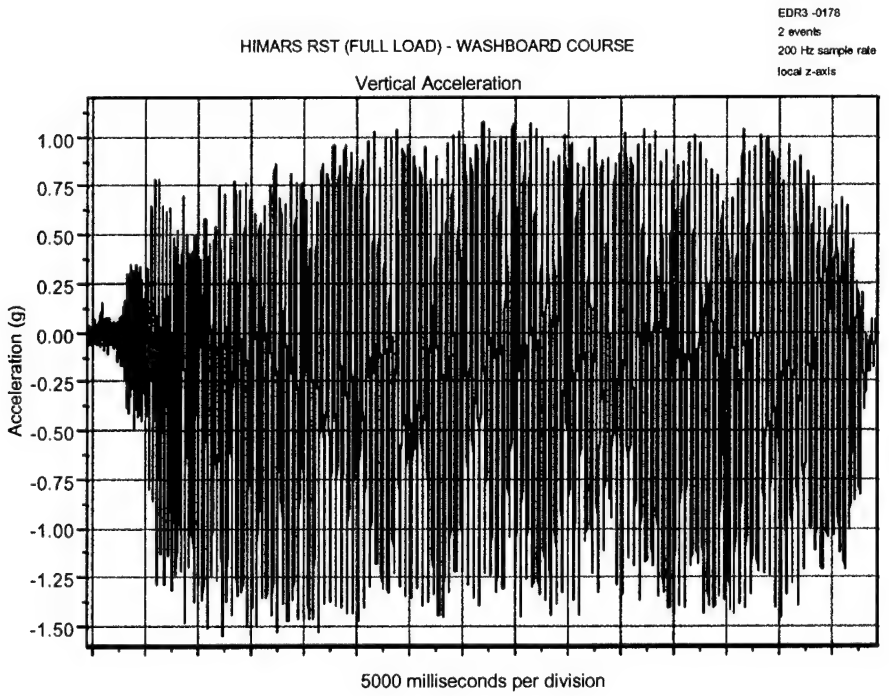

EDR3 -0178
1 event
200 Hz sample rate
local y-axis
HIMARS RSV (FULL LOAD) - WASHBOARD COURSE
Lateral Acceleration
0.25
0.20
0.15
0.10
0.05
0.00
-0.05
-0.10
-0.15
-0.20
Acceleration (g)
5000 milliseconds per division

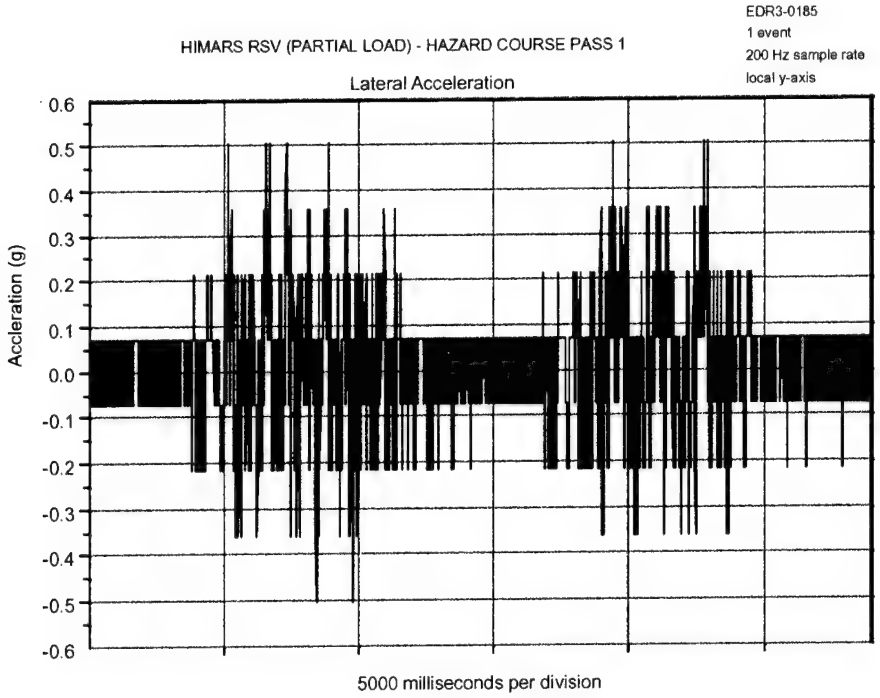

EDR3 -0178
1 event
200 Hz sample rate
local z-axis
HIMARS RSV (FULL LOAD) - WASHBOARD COURSE
Longitudinal Acceleration
0.60
0.45
0.30
0.15
0.00
-0.15
-0.30
-0.45
-0.60
Acceleration (g)
5000 milliseconds per division

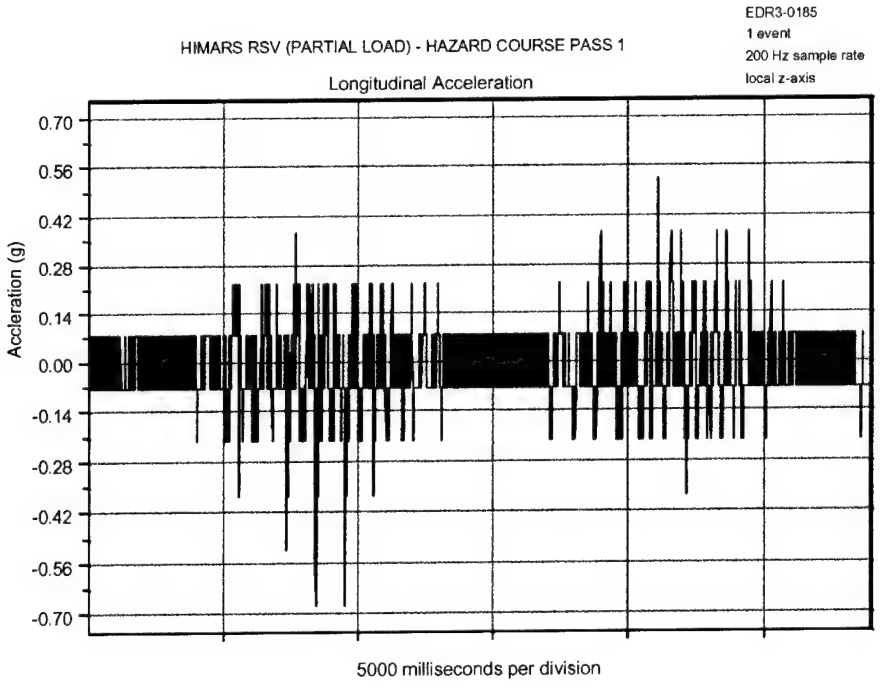

EDR3-0185
2 events
200 Hz sample rate
local x-axis
HIMARS RSV (PARTIAL LOAD) - WASHBOARD COURSE
Vertical Acceleration
0.70
0.56
0.42
0.28
0.14
0.00
-0.14
-0.28
-0.42
-0.56
-0.70
Acceleration (g)
5000 milliseconds per division

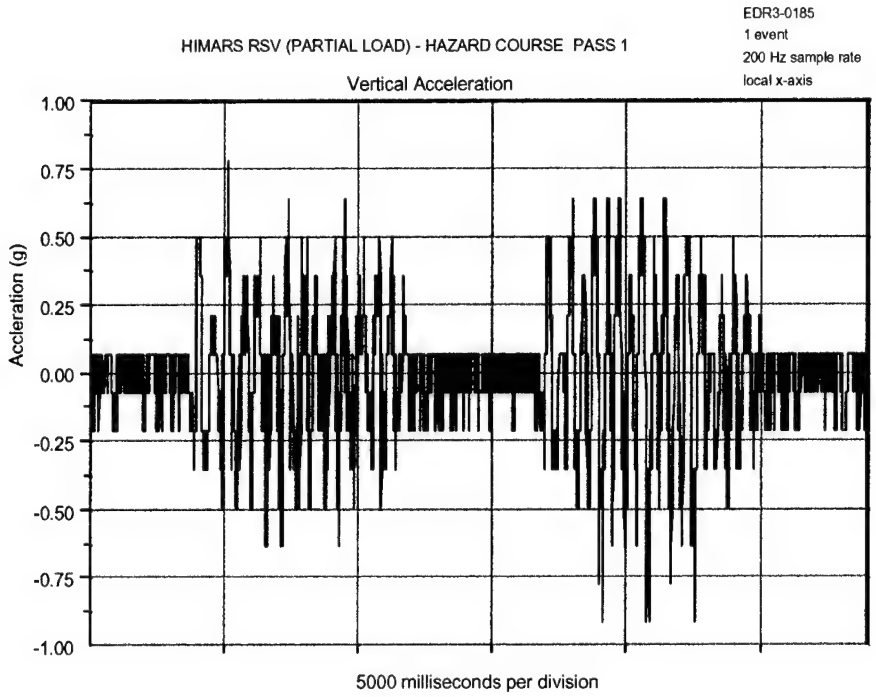

EDR3 -0178
2 events
200 Hz sample rate
local y-axis
HIMARS RST (FULL LOAD) - WASHBOARD COURSE
Lateral Acceleration
0.5
0.4
0.3
0.2
0.1
0.0
-0.1
-0.2
-0.3
-0.4
Acceleration (g)
5000 milliseconds per division

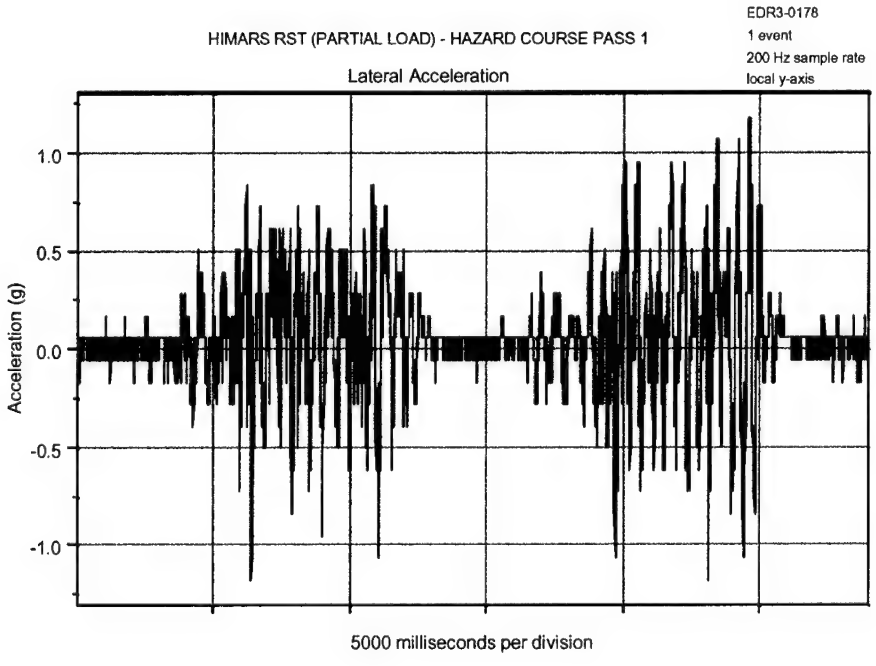

EDR3 -0178
2 events
200 Hz sample rate
local x-axis
HIMARS RST (FULL LOAD) - WASHBOARD COURSE
Longitudinal Acceleration
0.5
0.4
0.3
0.2
0.1
0.0
-0.1
-0.2
-0.3
-0.4
-0.5
Acceleration (g)
5000 milliseconds per division

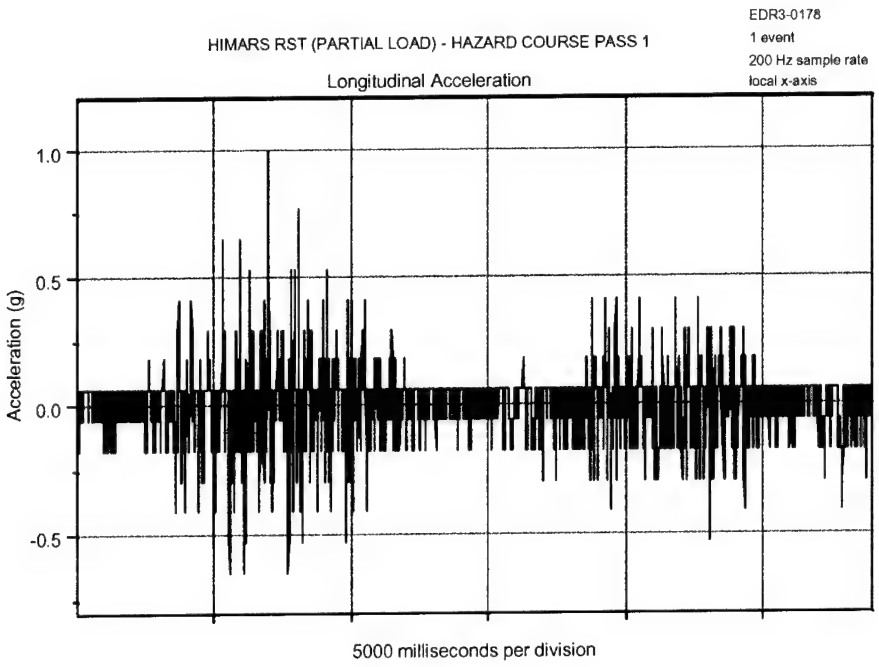

EDR3 -0178
2 events
200 Hz sample rate
local z-axis
HIMARS RST (FULL LOAD) - WASHBOARD COURSE
Vertical Acceleration
1.00
0.75
0.50
0.25
0.00
-0.25
-0.50
-0.75
-1.00
-1.25
-1.50
Acceleration (g)
5000 milliseconds per division

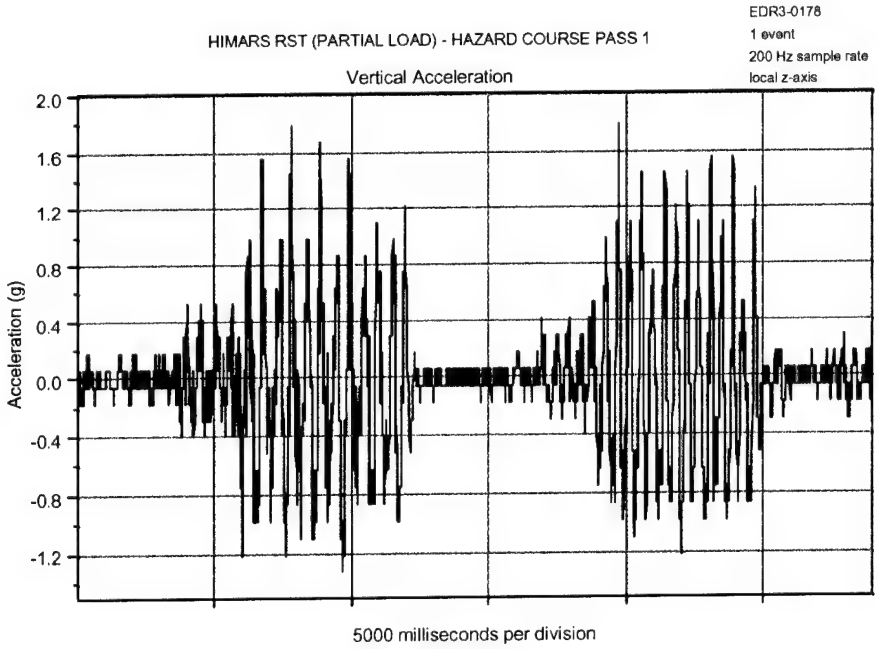

EDR3-0185
1 event
200 Hz sample rate
local y-axis
HIMARS RSV (PARTIAL LOAD) - HAZARD COURSE PASS 1
Lateral Acceleration
Accleration (g)
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
5000 milliseconds per division

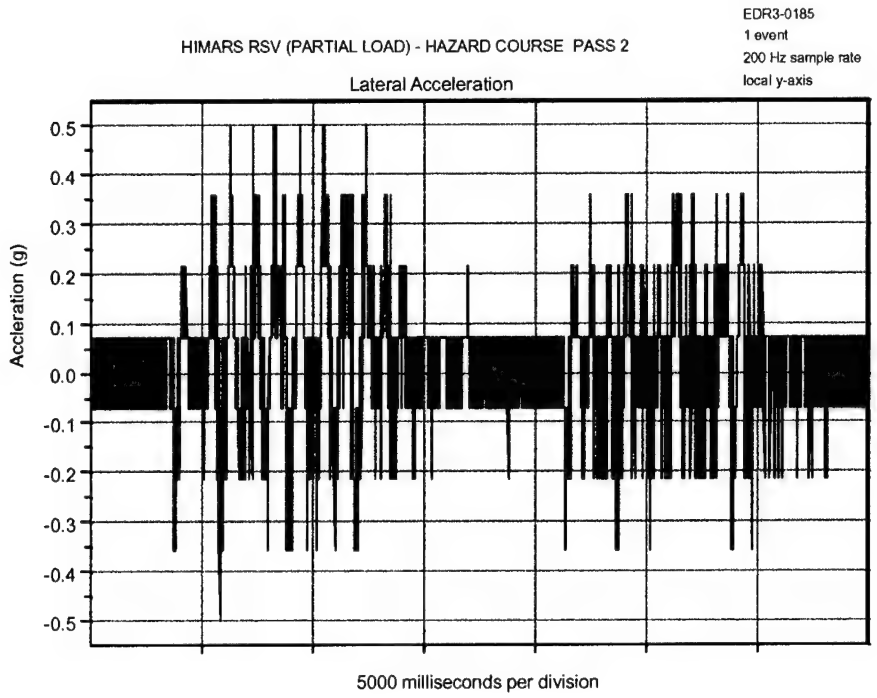

EDR3-0185
1 event
200 Hz sample rate
local z-axis
HIMARS RSV (PARTIAL LOAD) - HAZARD COURSE PASS 1
Longitudinal Acceleration
Accleration (g)
0.70
0.56
0.42
0.28
0.14
0.00
-0.14
-0.28
-0.42
-0.56
-0.70
5000 milliseconds per division

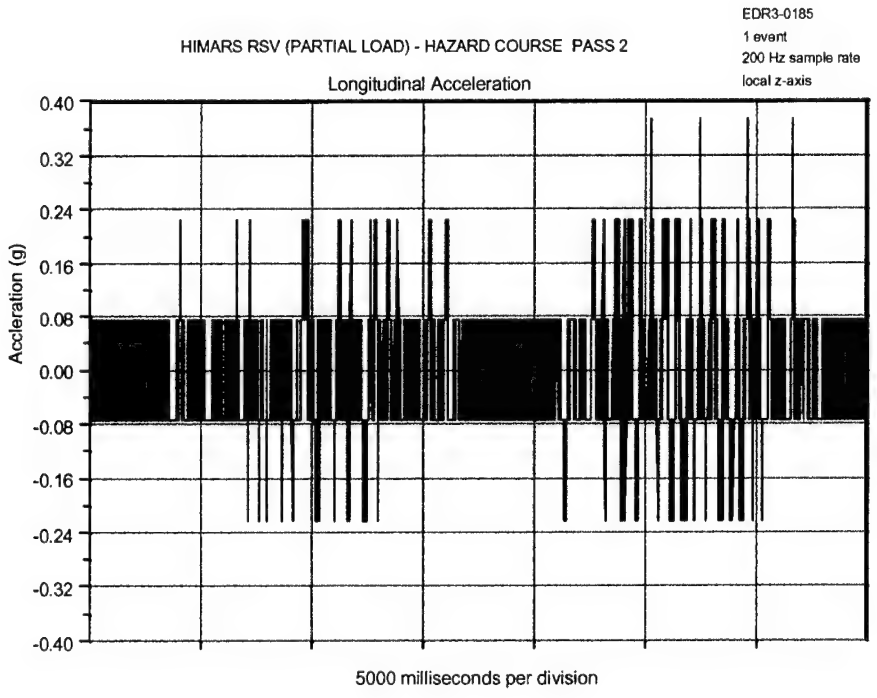

EDR3-0185
1 event
200 Hz sample rate
local x-axis
HIMARS RSV (PARTIAL LOAD) - HAZARD COURSE PASS 1
Vertical Acceleration
1.00
0.75
0.50
0.25
0.00
-0.25
-0.50
-0.75
-1.00
Accleration (g)
5000 milliseconds per division

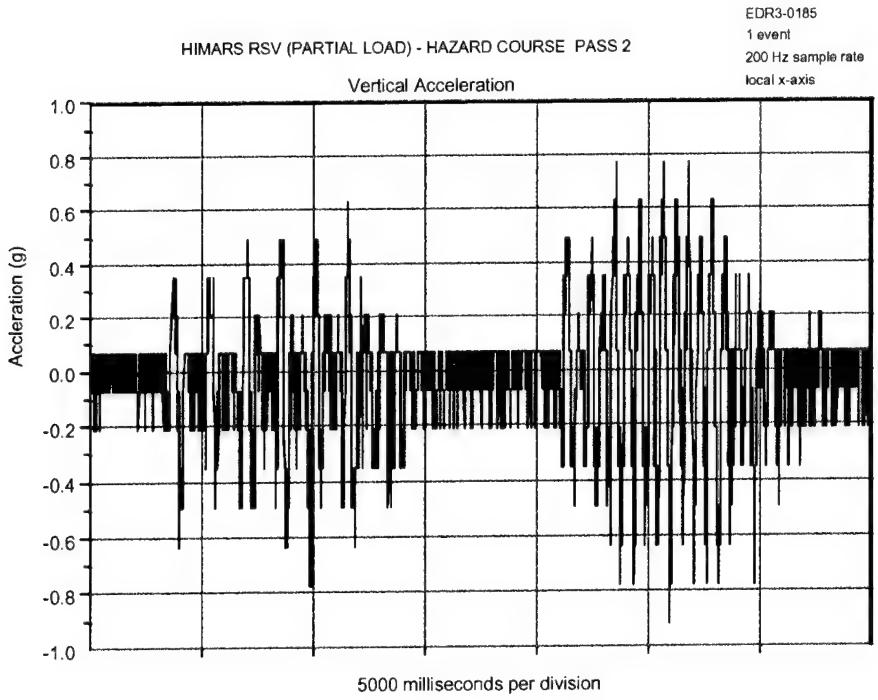

EDR3-0178
1 event
200 Hz sample rate
local y-axis
HIMARS RST (PARTIAL LOAD) - HAZARD COURSE PASS 1
Lateral Acceleration
1.0
0.5
0.0
-0.5
-1.0
Acceleration (g)
5000 milliseconds per division

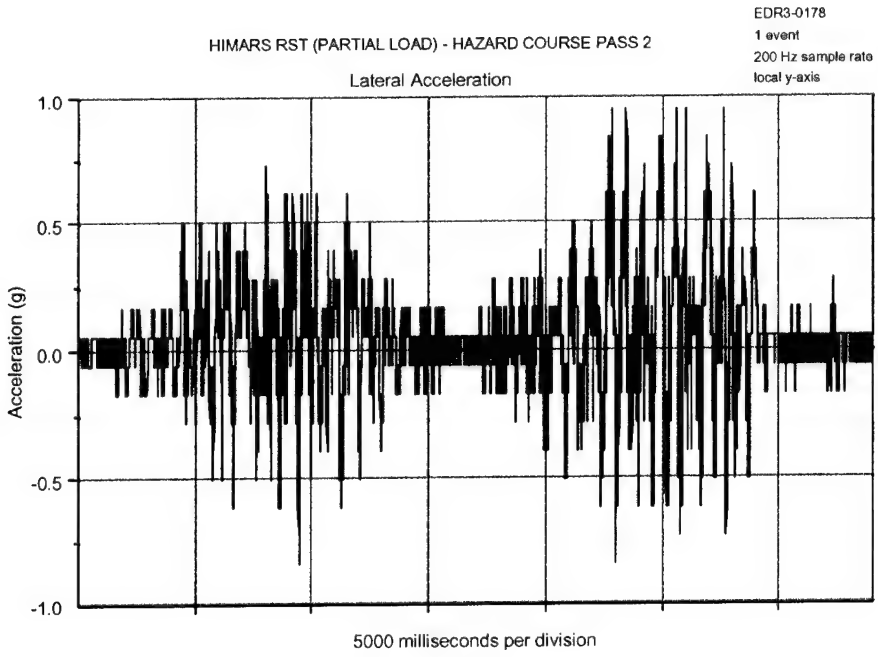

EDR3-0178
1 event
200 Hz sample rate
local x-axis
HIMARS RST (PARTIAL LOAD) - HAZARD COURSE PASS 1
Longitudinal Acceleration
1.0
0.5
0.0
-0.5
Acceleration (g)
5000 milliseconds per division

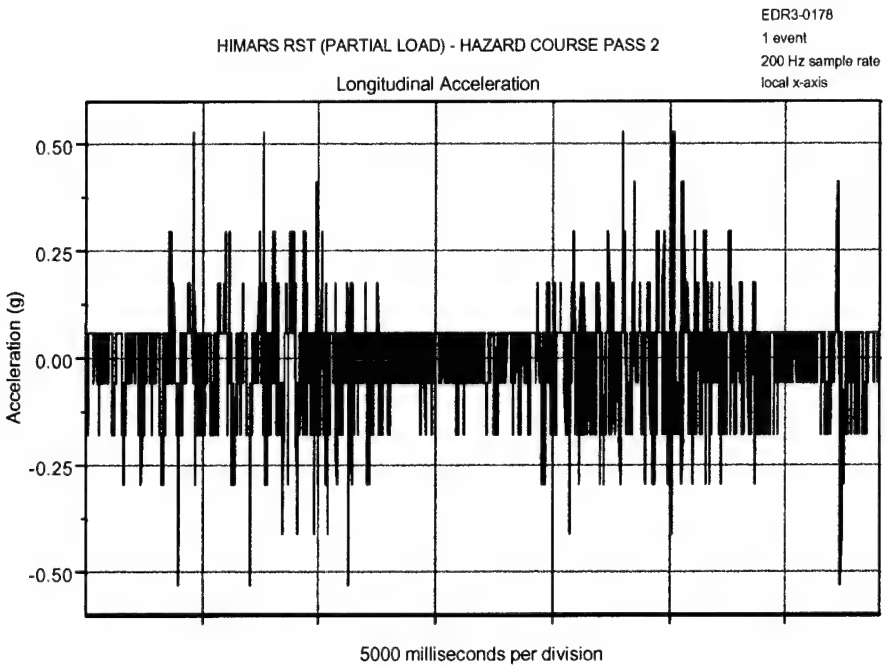

EDR3-0178
1 event
200 Hz sample rate
local z-axis
HIMARS RST (PARTIAL LOAD) - HAZARD COURSE PASS 1
Vertical Acceleration
2.0
1.6
1.2
0.8
0.4
0.0
-0.4
-0.8
-1.2
Acceleration (g)
5000 milliseconds per division

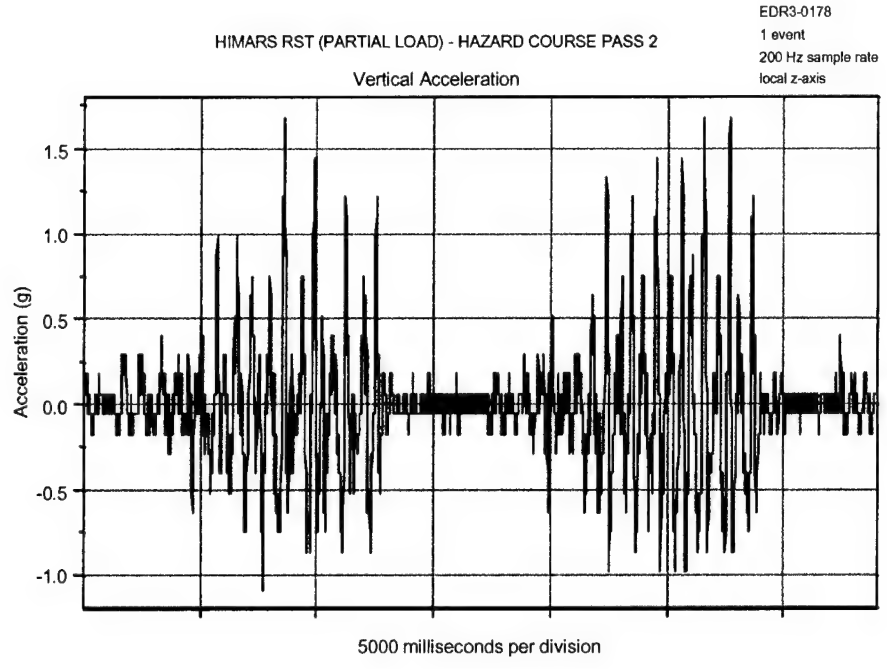

EDR3-0185
1 event
200 Hz sample rate
local y-axis
HIMARS RSV (PARTIAL LOAD) - HAZARD COURSE PASS 2
Lateral Acceleration
Acceleration (g)
0.5
0.4
0.3
0.2
0.1
0.0
-0.1
-0.2
-0.3
-0.4
-0.5
5000 milliseconds per division

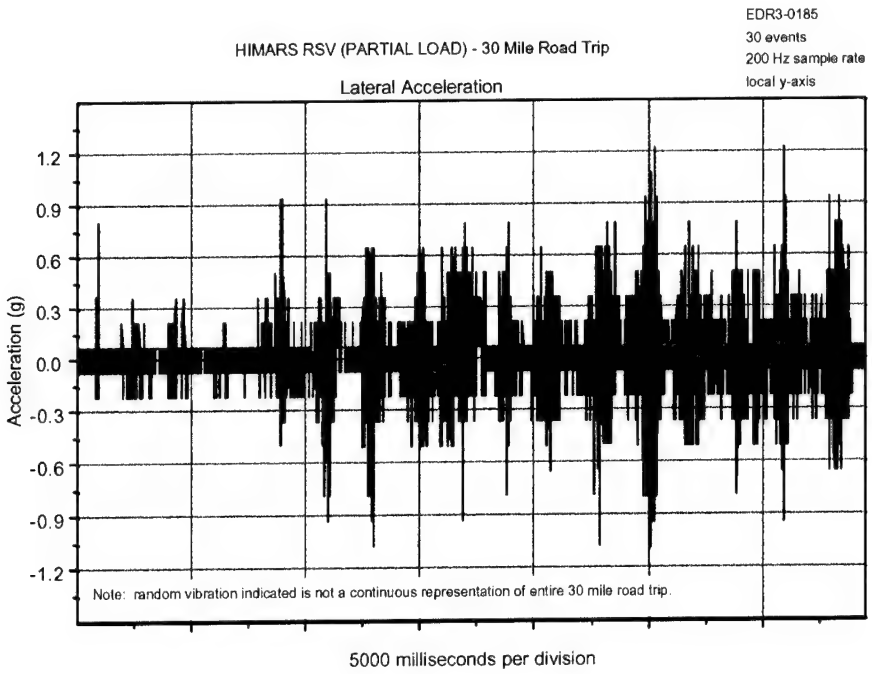

EDR3-0185
1 event
200 Hz sample rate
local z-axis
HIMARS RSV (PARTIAL LOAD) - HAZARD COURSE PASS 2
Longitudinal Acceleration
Acceleration (g)
0.40
0.32
0.24
0.16
0.08
0.00
-0.08
-0.16
-0.24
-0.32
-0.40
5000 milliseconds per division

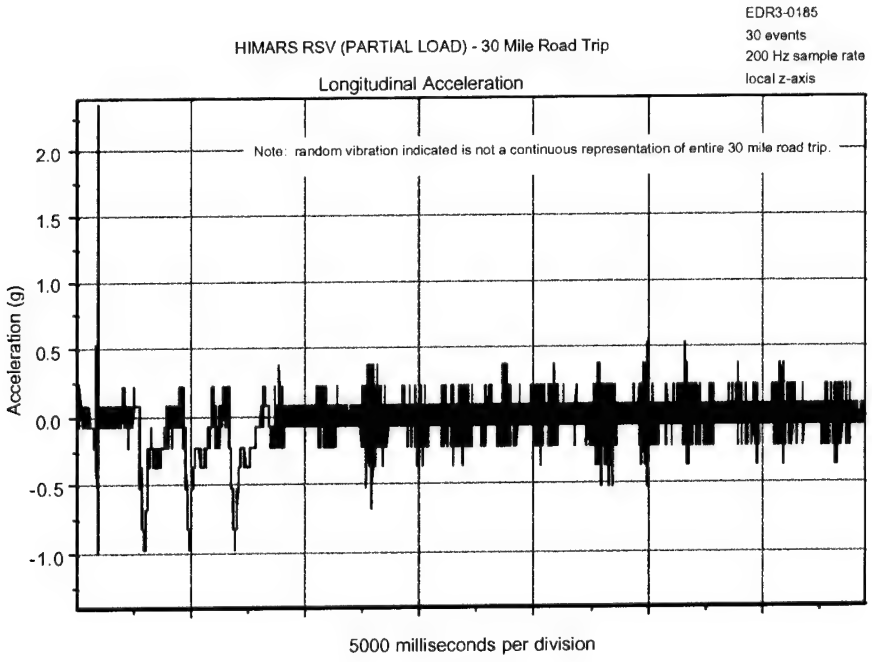

EDR3-0185
1 event
200 Hz sample rate
local x-axis
HIMARS RSV (PARTIAL LOAD) - HAZARD COURSE PASS 2
Vertical Acceleration
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
-0.4
-0.6
-0.8
-1.0
Accleration (g)
5000 milliseconds per division

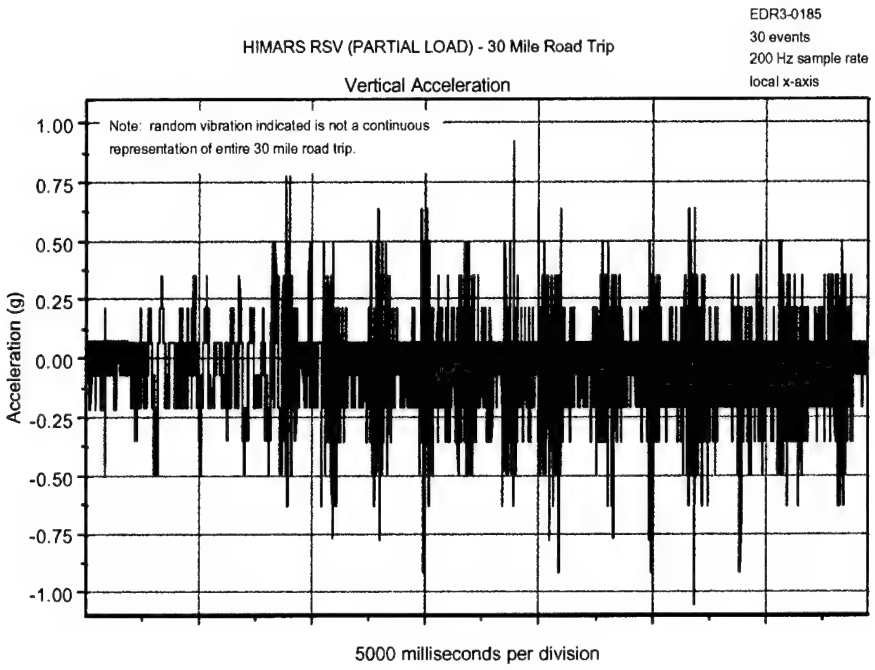

EDR3-0178
1 event
200 Hz sample rate
local y-axis
HIMARS RST (PARTIAL LOAD) - HAZARD COURSE PASS 2
Lateral Acceleration
1.0
0.5
0.0
-0.5
-1.0
Acceleration (g)
5000 milliseconds per division

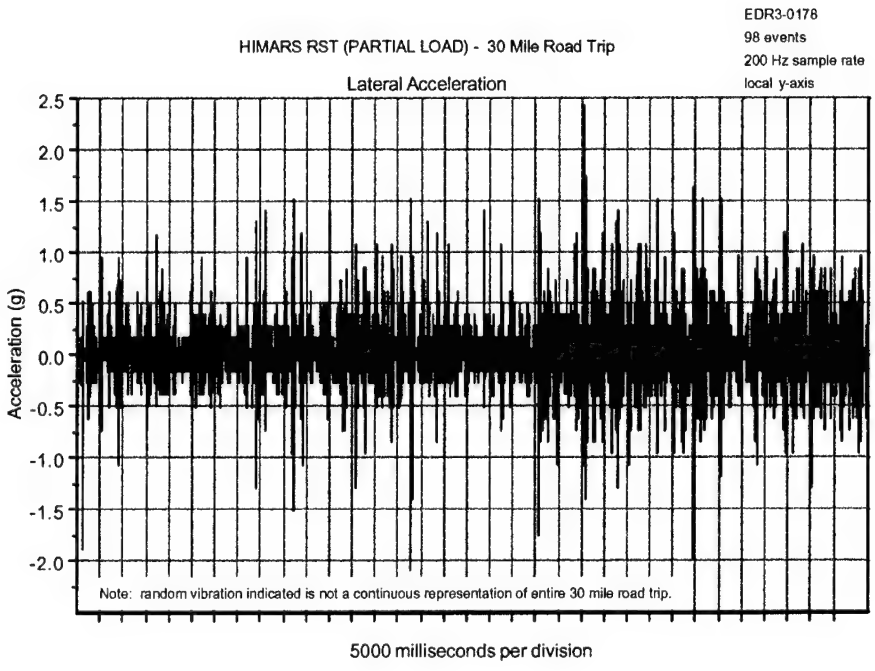

EDR3-0178
1 event
200 Hz sample rate
local x-axis
HIMARS RST (PARTIAL LOAD) - HAZARD COURSE PASS 2
Longitudinal Acceleration
0.50
0.25
0.00
-0.25
-0.50
Acceleration (g)
5000 milliseconds per division

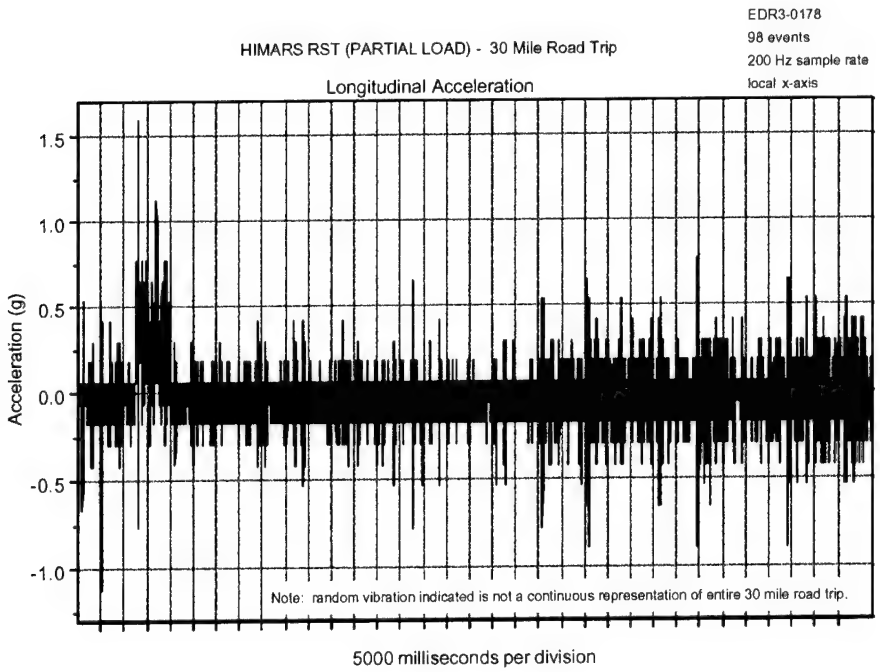

EDR3-0178
1 event
200 Hz sample rate
local z-axis
HIMARS RST (PARTIAL LOAD) - HAZARD COURSE PASS 2
Vertical Acceleration
1.5
1.0
0.5
0.0
-0.5
-1.0
Acceleration (g)
5000 milliseconds per division

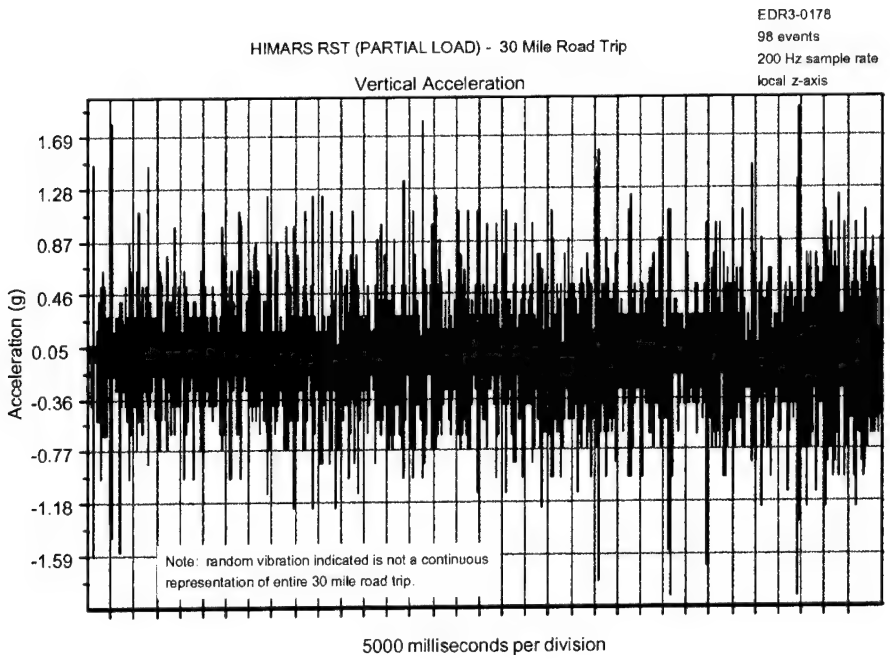

EDR3-0185
30 events
200 Hz sample rate
local y-axis
HIMARS RSV (PARTIAL LOAD) - 30 Mile Road Trip
Lateral Acceleration
Acceleration (g)
1.2
0.9
0.6
0.3
0.0
-0.3
-0.6
-0.9
-1.2
Note: random vibration indicated is not a continuous representation of entire 30 mile road trip.
5000 milliseconds per division

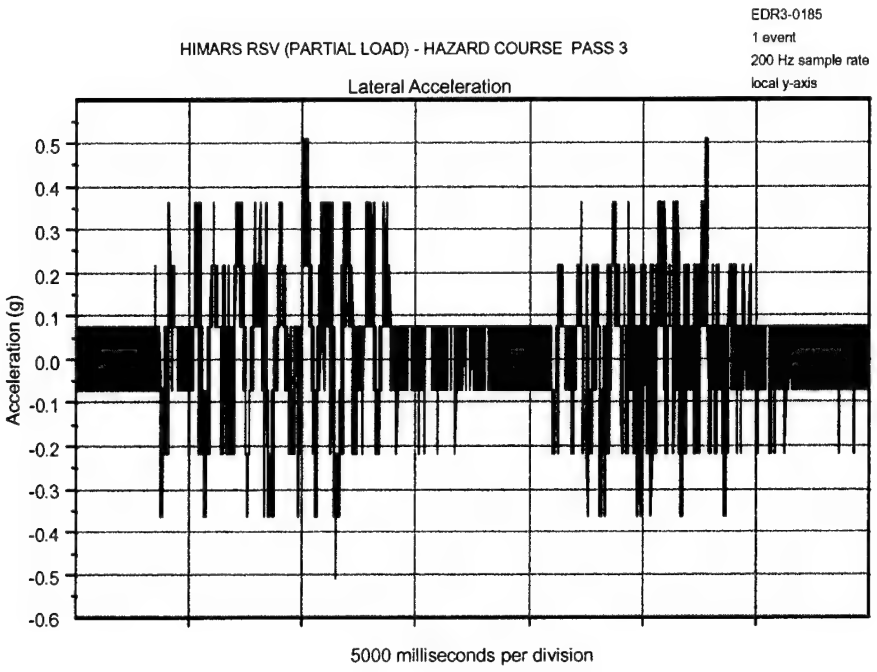

EDR3-0185
30 events
200 Hz sample rate
local z-axis
HIMARS RSV (PARTIAL LOAD) - 30 Mile Road Trip
Longitudinal Acceleration
Note: random vibration indicated is not a continuous representation of entire 30 mile road trip.
Acceleration (g)
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
5000 milliseconds per division

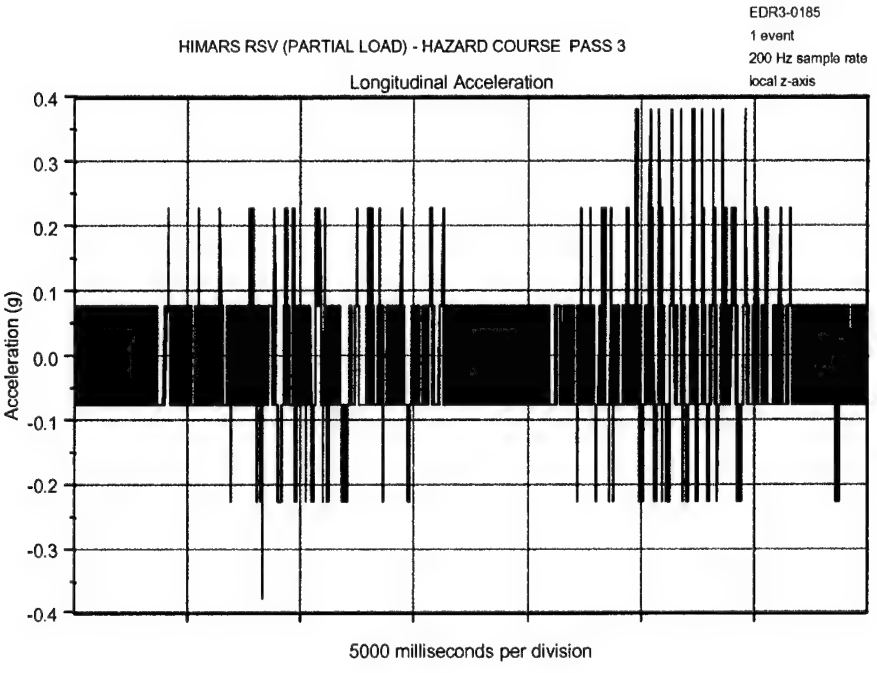

EDR3-0185
30 events
200 Hz sample rate
local x-axis
HIMARS RSV (PARTIAL LOAD) - 30 Mile Road Trip
Vertical Acceleration
Note: random vibration indicated is not a continuous representation of entire 30 mile road trip.
1.00
0.75
0.50
0.25
0.00
-0.25
-0.50
-0.75
-1.00
Acceleration (g)
5000 milliseconds per division

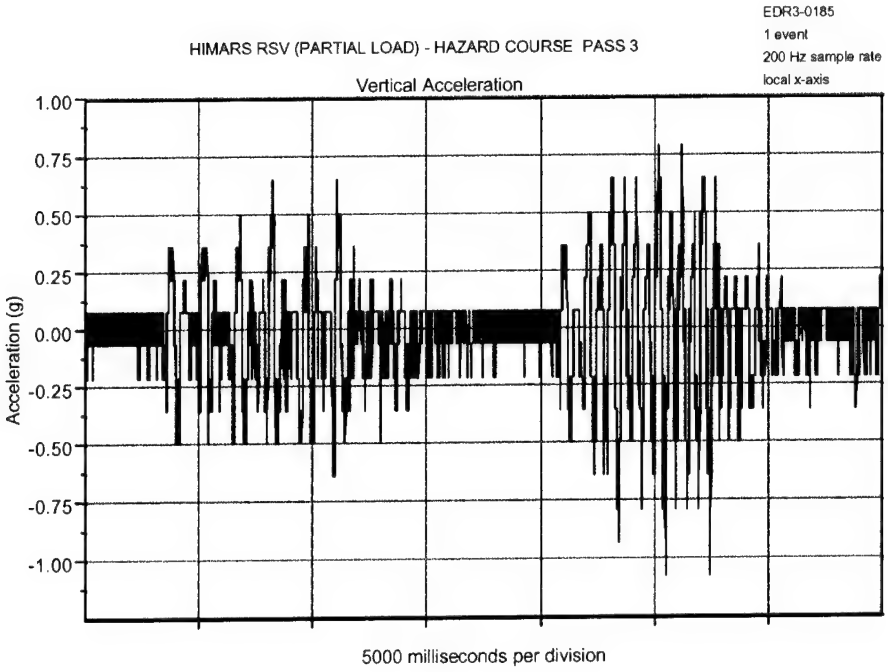

EDR3-0178
98 events
200 Hz sample rate
local y-axis
HIMARS RST (PARTIAL LOAD) - 30 Mile Road Trip
Lateral Acceleration
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
-1.5
-2.0
Acceleration (g)
Note: random vibration indicated is not a continuous representation of entire 30 mile road trip.
5000 milliseconds per division

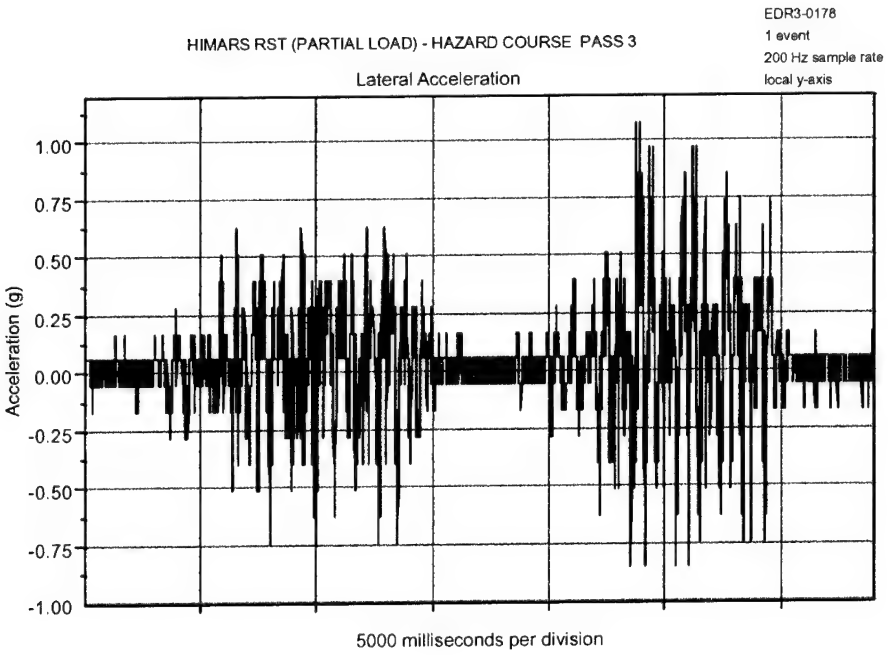

EDR3-0178
98 events
200 Hz sample rate
local x-axis
HIMARS RST (PARTIAL LOAD) - 30 Mile Road Trip
Longitudinal Acceleration
1.5
1.0
0.5
0.0
-0.5
-1.0
Acceleration (g)
Note: random vibration indicated is not a continuous representation of entire 30 mile road trip.
5000 milliseconds per division

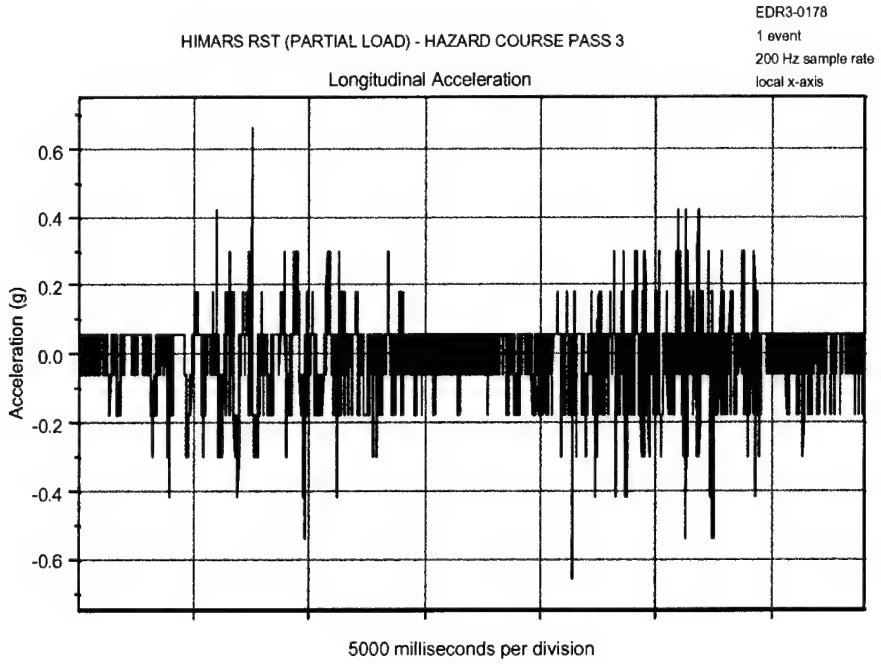

EDR3-0178
98 events
200 Hz sample rate
local z-axis
HIMARS RST (PARTIAL LOAD) - 30 Mile Road Trip
Vertical Acceleration
1.69
1.28
0.87
0.46
0.05
-0.36
-0.77
-1.18
-1.59
Acceleration (g)
Note: random vibration indicated is not a continuous representation of entire 30 mile road trip.
5000 milliseconds per division

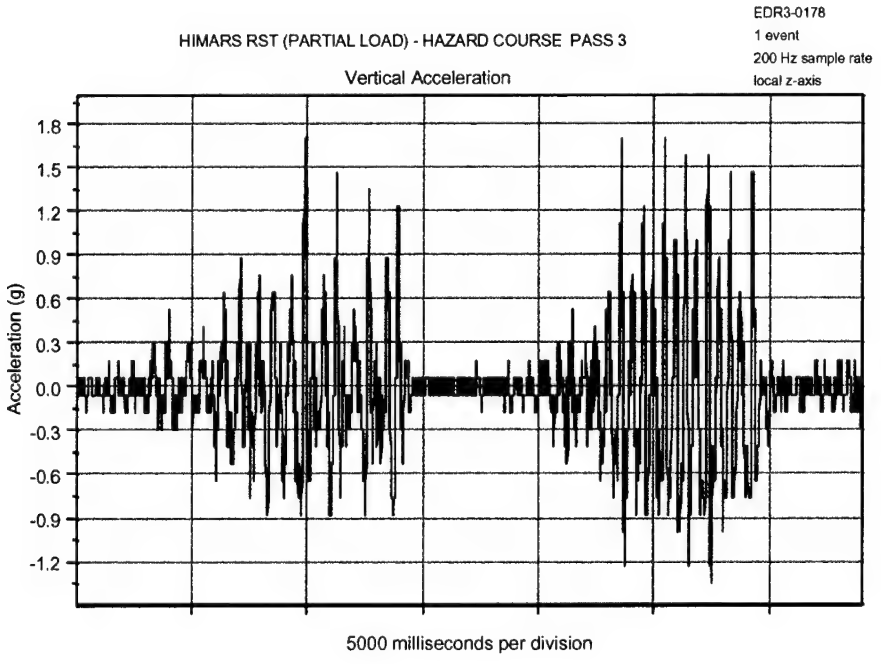

EDR3-0185
1 event
200 Hz sample rate
local y-axis
HIMARS RSV (PARTIAL LOAD) - HAZARD COURSE PASS 3
Lateral Acceleration
Acceleration (g)
0.5
0.4
0.3
0.2
0.1
0.0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
5000 milliseconds per division

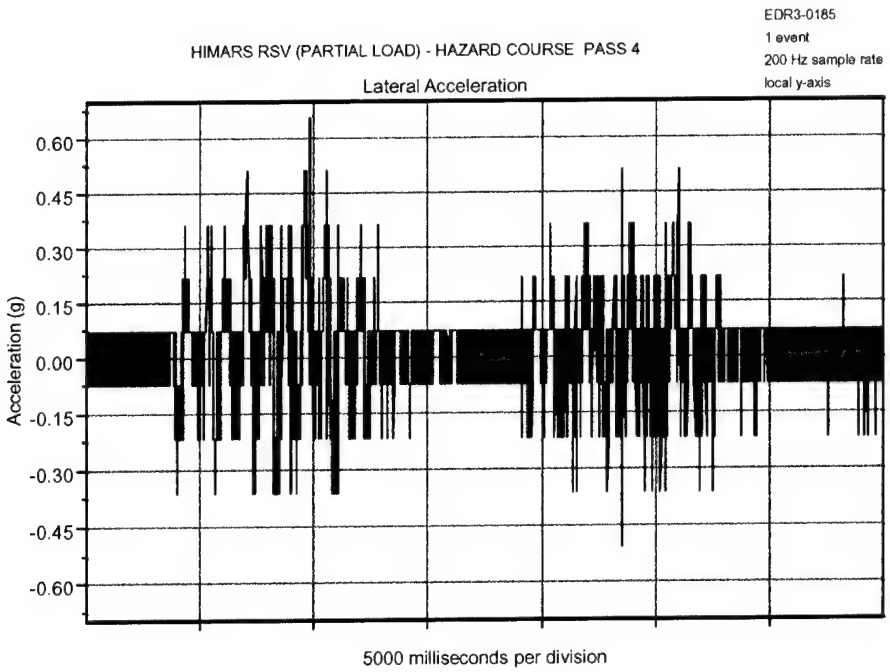

EDR3-0185
1 event
200 Hz sample rate
local z-axis
HIMARS RSV (PARTIAL LOAD) - HAZARD COURSE PASS 3
Longitudinal Acceleration
Acceleration (g)
0.4
0.3
0.2
0.1
0.0
-0.1
-0.2
-0.3
-0.4
5000 milliseconds per division

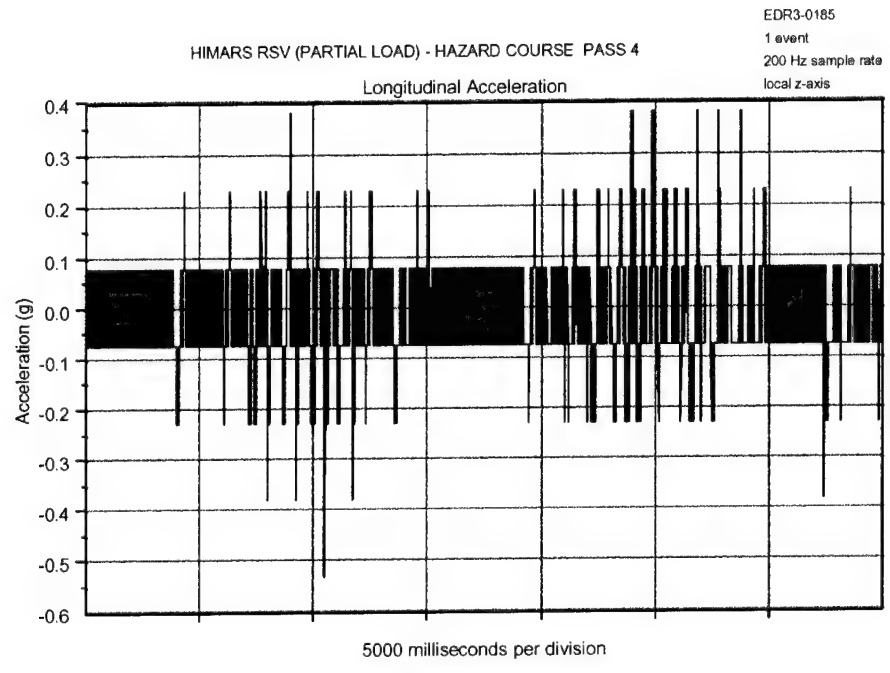

EDR3-0185
1 event
200 Hz sample rate
local x-axis
HIMARS RSV (PARTIAL LOAD) - HAZARD COURSE PASS 3
Vertical Acceleration
1.00
0.75
0.50
0.25
0.00
-0.25
-0.50
-0.75
-1.00
Acceleration (g)
5000 milliseconds per division

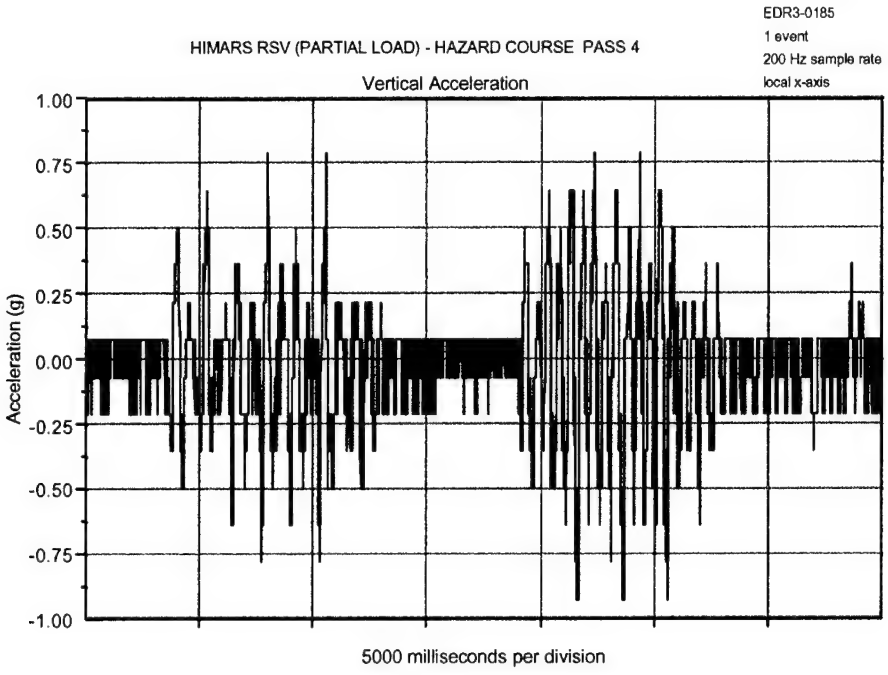

EDR3-0178
1 event
200 Hz sample rate
local y-axis
HIMARS RST (PARTIAL LOAD) - HAZARD COURSE PASS 3
Lateral Acceleration
1.00
0.75
0.50
0.25
0.00
-0.25
-0.50
-0.75
-1.00
Acceleration (g)
5000 milliseconds per division

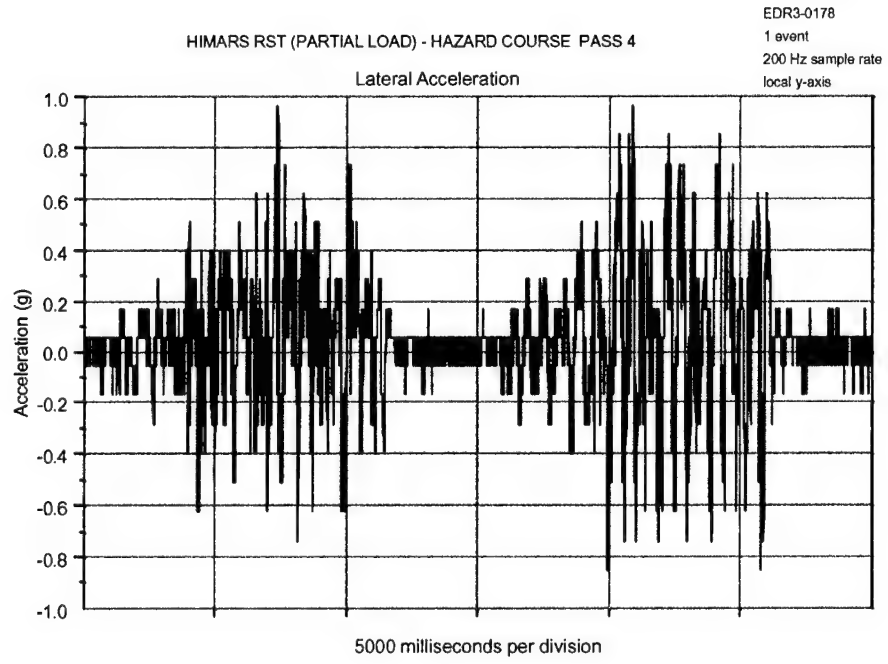

EDR3-0178
1 event
200 Hz sample rate
local x-axis
HIMARS RST (PARTIAL LOAD) - HAZARD COURSE PASS 3
Longitudinal Acceleration
0.6
0.4
0.2
0.0
-0.2
-0.4
-0.6
Acceleration (g)
5000 milliseconds per division

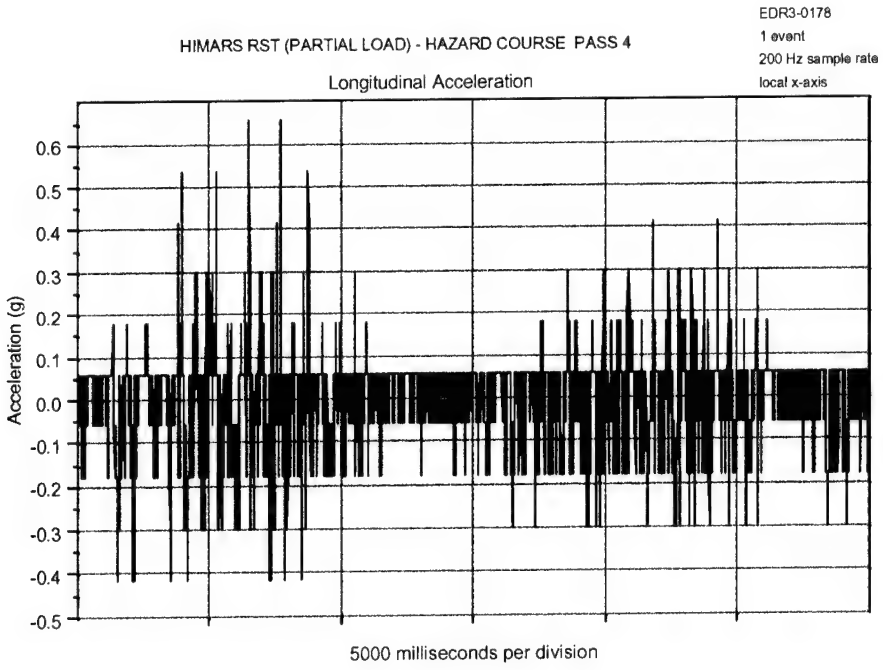

EDR3-0178
1 event
200 Hz sample rate
local z-axis
HIMARS RST (PARTIAL LOAD) - HAZARD COURSE PASS 3
Vertical Acceleration
1.8
1.5
1.2
0.9
0.6
0.3
0.0
-0.3
-0.6
-0.9
-1.2
Acceleration (g)
5000 milliseconds per division

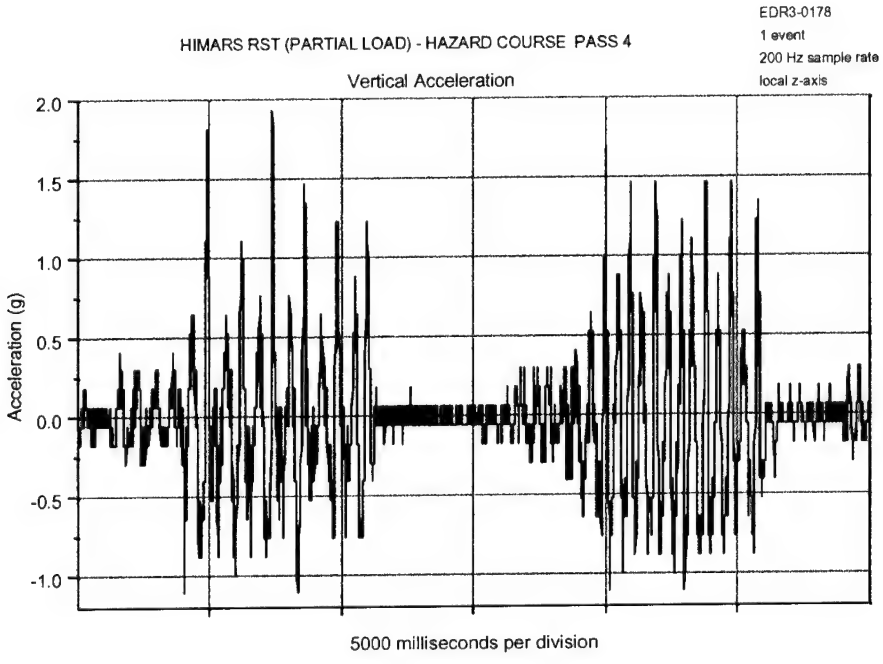

EDR3-0185
1 event
200 Hz sample rate
local y-axis
HIMARS RSV (PARTIAL LOAD) - HAZARD COURSE PASS 4
Lateral Acceleration
0.60
0.45
0.30
0.15
0.00
-0.15
-0.30
-0.45
-0.60
Acceleration (g)
5000 milliseconds per division

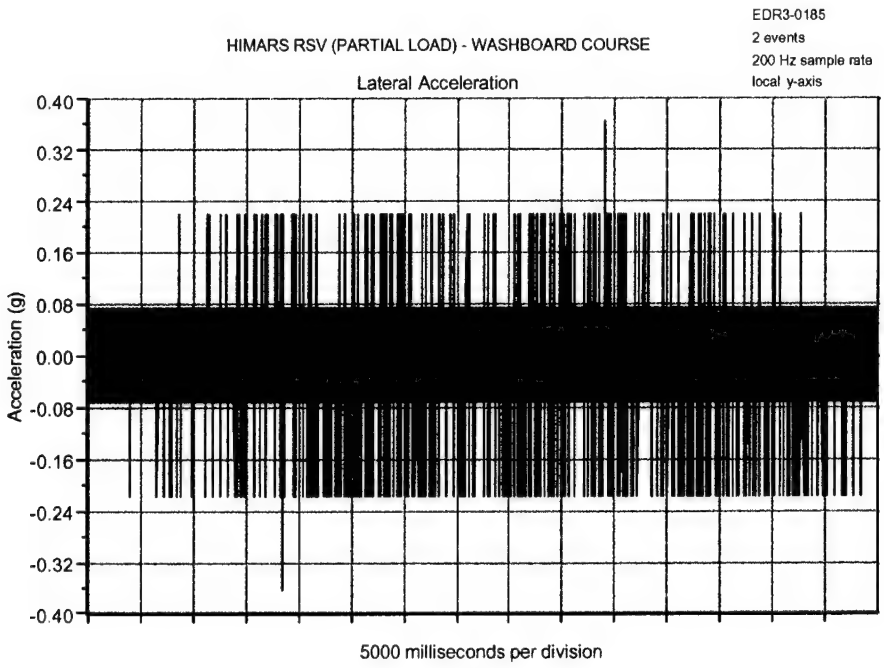

EDR3-0185
1 event
200 Hz sample rate
local z-axis
HIMARS RSV (PARTIAL LOAD) - HAZARD COURSE PASS 4
Longitudinal Acceleration
0.4
0.3
0.2
0.1
0.0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
Acceleration (g)
5000 milliseconds per division

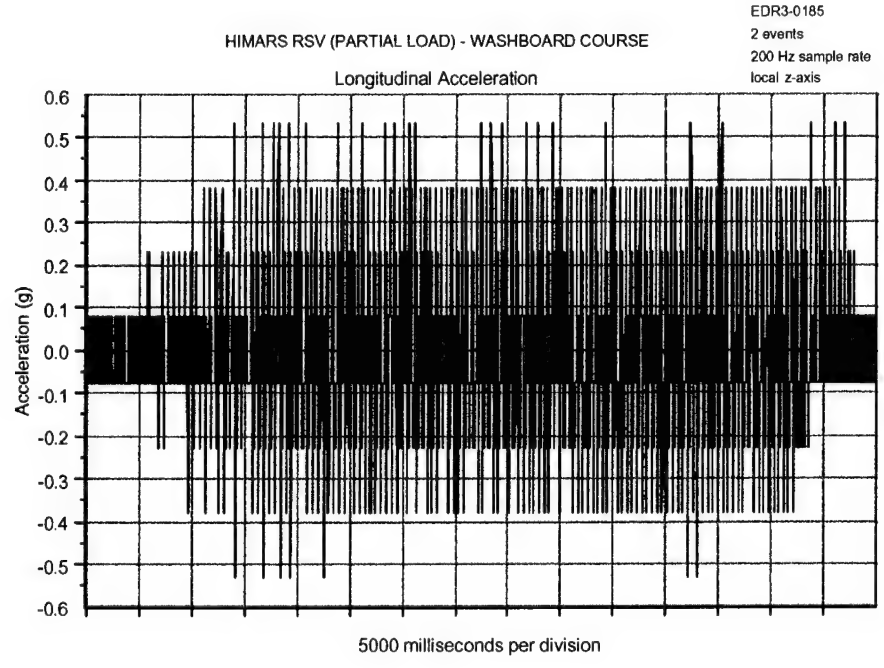

EDR3-0185
1 event
200 Hz sample rate
local x-axis
HIMARS RSV (PARTIAL LOAD) - HAZARD COURSE PASS 4
Vertical Acceleration
1.00
0.75
0.50
0.25
0.00
-0.25
-0.50
-0.75
-1.00
Acceleration (g)
5000 milliseconds per division

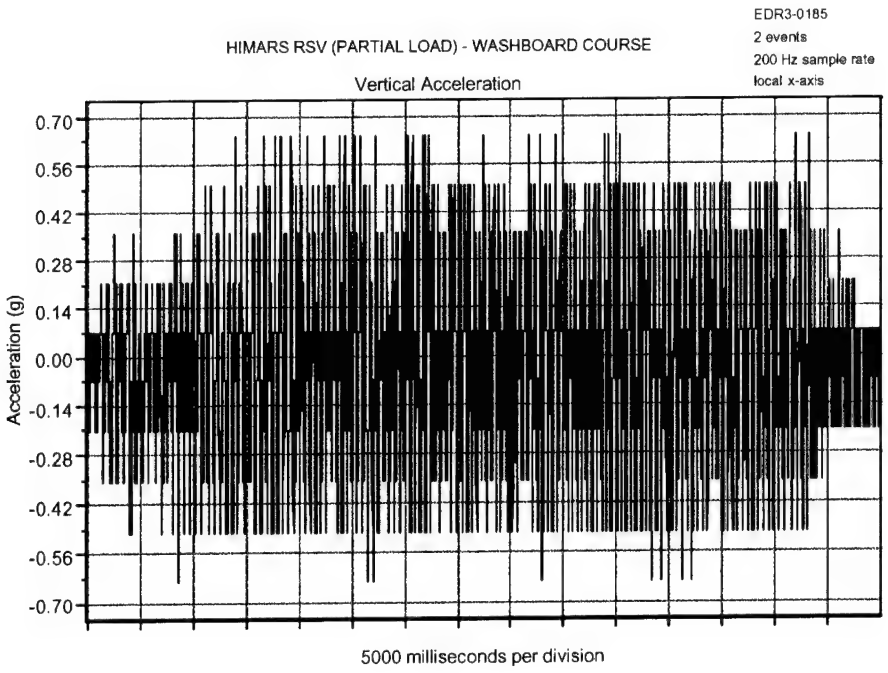

EDR3-0178
1 event
200 Hz sample rate
local y-axis
HIMARS RST (PARTIAL LOAD) - HAZARD COURSE PASS 4
Lateral Acceleration
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
-0.4
-0.6
-0.8
-1.0
Acceleration (g)
5000 milliseconds per division

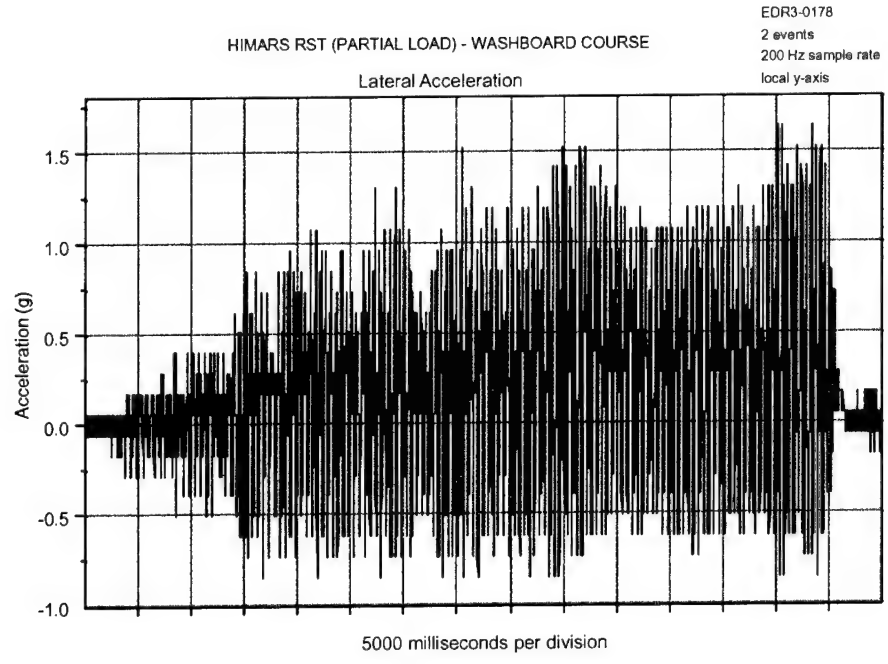

EDR3-0178
1 event
200 Hz sample rate
local x-axis
HIMARS RST (PARTIAL LOAD) - HAZARD COURSE PASS 4
Longitudinal Acceleration
Acceleration (g)
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-0.1
-0.2
-0.3
-0.4
-0.5
5000 milliseconds per division

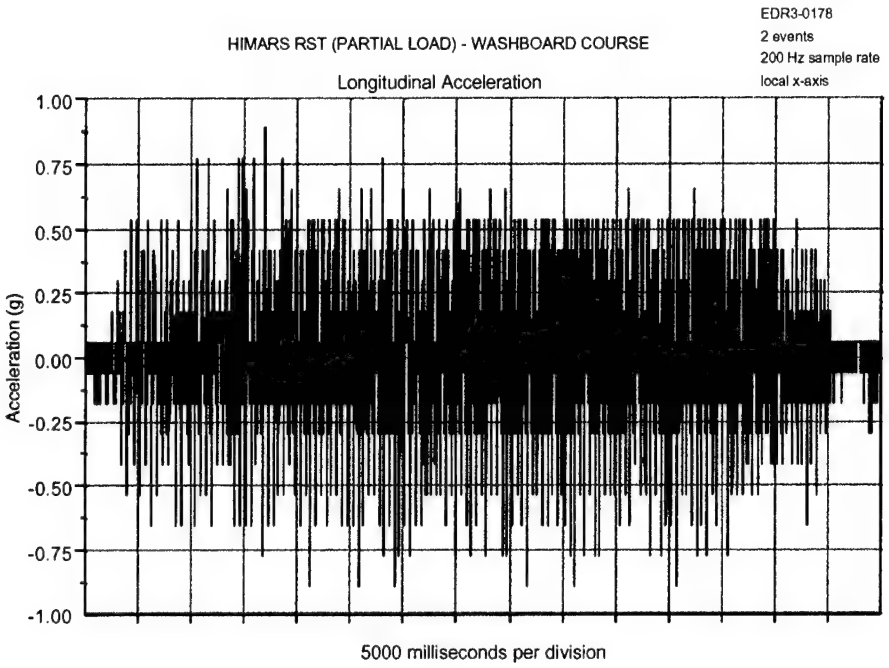

EDR3-0178
1 event
200 Hz sample rate
local z-axis
HIMARS RST (PARTIAL LOAD) - HAZARD COURSE PASS 4
Vertical Acceleration
Acceleration (g)
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
5000 milliseconds per division

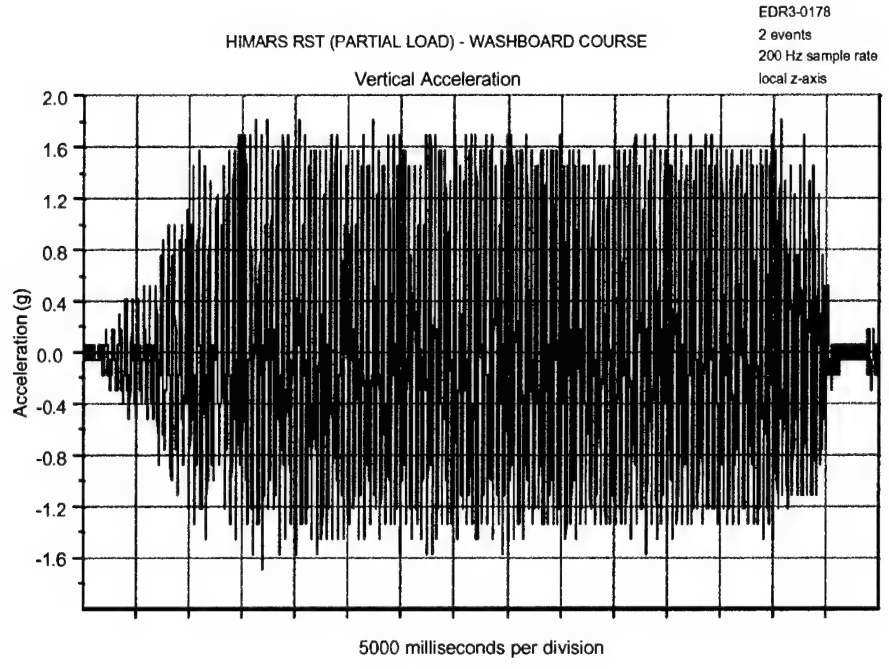

EDR3-0185
2 events
200 Hz sample rate
local y-axis
HIMARS RSV (PARTIAL LOAD) - WASHBOARD COURSE
Lateral Acceleration
0.40
0.32
0.24
0.16
0.08
0.00
-0.08
-0.16
-0.24
-0.32
-0.40
Acceleration (g)
5000 milliseconds per division


EDR3-0185
2 events
200 Hz sample rate
local z-axis
HIMARS RSV (PARTIAL LOAD) - WASHBOARD COURSE
Longitudinal Acceleration
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
Acceleration (g)
5000 milliseconds per division


EDR3-0185
2 events
200 Hz sample rate
local x-axis
HIMARS RSV (PARTIAL LOAD) - WASHBOARD COURSE
Vertical Acceleration
0.70
0.56
0.42
0.28
0.14
0.00
-0.14
-0.28
-0.42
-0.56
-0.70
Acceleration (g)
5000 milliseconds per division


EDR3-0178
2 events
200 Hz sample rate
local y-axis
HIMARS RST (PARTIAL LOAD) - WASHBOARD COURSE
Lateral Acceleration
1.5
1.0
0.5
0.0
-0.5
-1.0
Acceleration (g)
5000 milliseconds per division


EDR3-0178
2 events
200 Hz sample rate
local x-axis
HIMARS RST (PARTIAL LOAD) - WASHBOARD COURSE
Longitudinal Acceleration
1.00
0.75
0.50
0.25
0.00
-0.25
-0.50
-0.75
-1.00
Acceleration (g)
5000 milliseconds per division


EDR3-0178
2 events
200 Hz sample rate
local z-axis
HIMARS RST (PARTIAL LOAD) - WASHBOARD COURSE
Vertical Acceleration
2.0
1.6
1.2
0.8
0.4
0.0
-0.4
-0.8
-1.2
-1.6
Acceleration (g)
5000 milliseconds per division

PART 7 – DRAWINGS

The following drawing represents the load configuration that was subjected to the test criteria.

MLRS

LOADING, TIEDOWN, AND UNLOADING PROCEDURES FOR THE ROCKET POD/CONTAINER (RP/C) FOR THE MULTIPLE LAUNCH ROCKET SYSTEM IN/ON TACTICAL VEHICLES

INDEX

U.S. ARMY MATERIEL COMMAND DRAWING

APPROVED, U.S. ARMY MISSILE COMMAND

APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND

U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL

DRAFTSMAN	TECHNICIAN	ENGINEER
B. LEONARD		J. SIMONS

VALIDATION ENGINEERING DIVISION	TRANSPORTATION ENGINEERING DIVISION	LOGISTICS ENGINEERING OFFICE
	W. Zurick	T. J. Mehl

FEBRUARY 1982

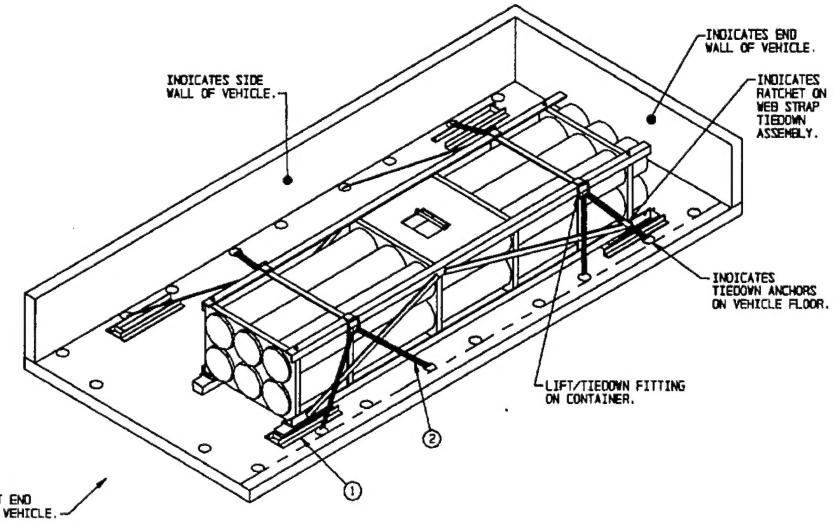
CLASS	DIVISION	DRAWING	FILE
19	48	8152	GM17RS1

REVISION NO. 2 — APRIL 1995

SEE THE REVISION LISTING ON PAGE 3

DO NOT SCALE

PROJECT GM 725-80



ISOMETRIC VIEW

SPECIAL NOTES:

1. A LOAD OF ONE CONTAINER IS SHOWN IN A 10-TON M977/M985 HEAVY EXPANDED MOBILITY TACTICAL TRUCK, HAVING INSIDE DIMENSIONS OF 216-3/8" LONG BY 90-3/4" WIDE, EQUIPPED WITH "SHOE" TYPE RESTRAINING DEVICES, AS SHOWN ON PAGE 28.
2. IF THE 10-TON M977/M985 HEMTT IS NOT EQUIPPED WITH THE "SHOE" TYPE RESTRAINING DEVICES USE THE PROCEDURES SHOWN ON PAGE 8 FOR LOADING AND TIEDOWN OF ONE CONTAINER.
3. A TOTAL OF FOUR WEB STRAP TIEDOWN ASSEMBLIES ARE REQUIRED FOR THE LOAD SHOWN ABOVE.

KEY NUMBERS

① SHOE ASSEMBLY (4 REQD). SEE THE DETAIL ON PAGE 26. PRE-POSITION EACH SHOE ASSEMBLY AS SHOWN IN THE "PLAN VIEW OF 10-TON M977/M985 HEMTT" DETAIL ON ON PAGE 27. SEE LOADING PROCEDURES NOTE 7 ON PAGE 14.

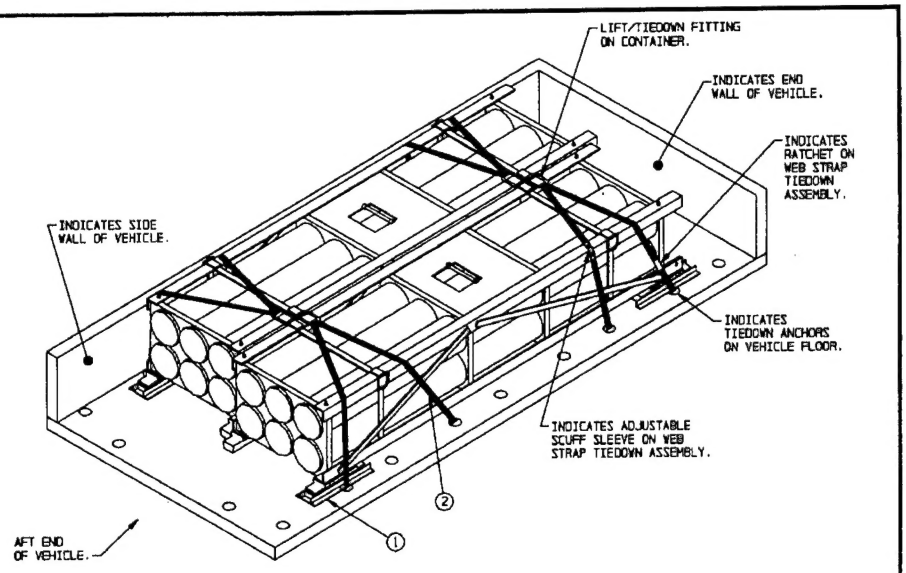
② WEB STRAP TIEDOWN ASSEMBLY (4 REQD). HOOK THE END OF THE STRAP THAT HAS THE RATCHET TO THE SECOND TIEDOWN ANCHOR FROM THE AFT AND FORWARD END OF THE CARGO DECK, THEN THE HOOK ON THE LONG END OF THE STRAP ASSEMBLY IS PASSED UPWARD TO A LIFT/TIEDOWN FITTING ON THE CONTAINER, THROUGH THE LIFTING RING FROM THE BOTTOM UP, BACK DOWN AND ATTACH THE FORWARD STRAP HOOK TO THE THIRD TIEDOWN ANCHOR FROM THE FORWARD END OF THE CARGO DECK AND ATTACH THE AFT STRAP HOOK TO THE FOURTH TIEDOWN ANCHOR FROM THE AFT END OF THE CARGO DECK. POSITION STRAP SCUFF SLEEVES AT SHARP EDGES. TAKE UP EXCESS SLACK IN STRAP AND RATCHET TIGHT. SEE GENERAL NOTES "D" AND "E" ON PAGE 2.

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
CONTAINER	1	5,078 LBS

10-TON M977/M985 HEAVY EXPANDED MOBILITY TACTICAL TRUCK (HEMTT) PAGE 15

PROJECT GM 725-80



ISOMETRIC VIEW

SPECIAL NOTES:

1. A LOAD OF TWO CONTAINERS IS SHOWN IN A 10-TON M977/M985 HEAVY EXPANDED MOBILITY TACTICAL TRUCK, HAVING INSIDE DIMENSIONS OF 218-3/8" LONG BY 90-3/4" WIDE, EQUIPPED WITH "SHOE" TYPE RESTRAINING DEVICES AS SHOWN ON PAGE 28.
2. IF THE 10-TON M977/M985 HEMTT IS NOT EQUIPPED WITH THE "SHOE" TYPE RESTRAINING DEVICES USE THE PROCEDURES SHOWN ON PAGE 8 FOR LOADING AND TIEDOWN OF TWO CONTAINERS.
3. WHEN POSITIONING CONTAINERS ON VEHICLES ASSURE THAT LIFTING RINGS ON CONTAINERS ARE OFF-SET LONGITUDINALLY AND RESTING ON TOP OF ADJACENT CONTAINER.
4. A TOTAL OF FOUR WEB STRAP TIEDOWN ASSEMBLIES ARE REQUIRED FOR THE LOAD SHOWN ABOVE.

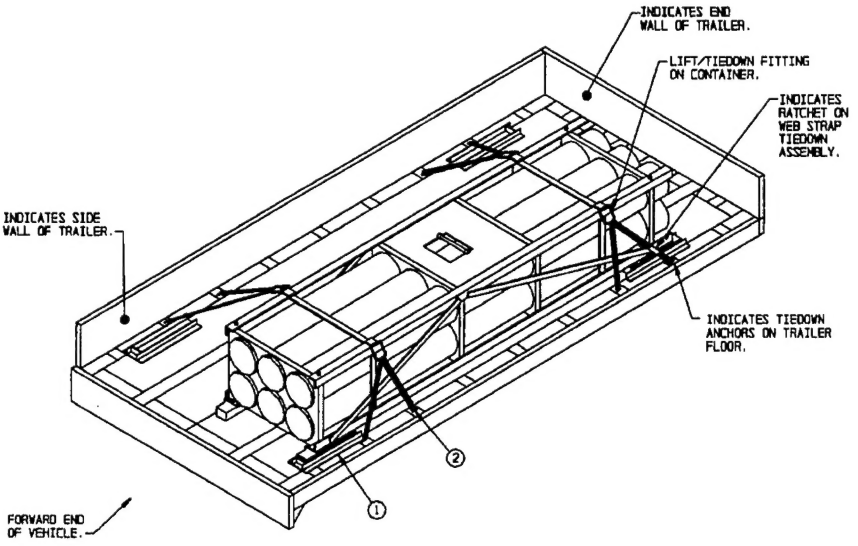
KEY NUMBERS

① SHOE ASSEMBLY (4 REQD). SEE THE DETAIL ON PAGE 28. PRE-POSITION EACH SHOE ASSEMBLY AS SHOWN IN THE "PLAN VIEW OF 10-TON M977/M985 HEMTT" DETAIL ON PAGE 27. SEE LOADING PROCEDURES NOTE 7 ON PAGE 14.

② WEB STRAP TIEDOWN ASSEMBLY (4 REQD). HOOK THE END OF THE STRAP THAT HAS THE RATCHET TO THE SECOND TIEDOWN ANCHOR FROM THE AFT END OF THE CARGO DECK. THEN THE HOOK ON THE LONG END OF THE STRAP ASSEMBLY IS PASSED UPWARD AND OVER THE TOP OF THE NEAR CONTAINER TO A LIFT/TIEDOWN FITTING ON THE OPPOSITE CONTAINER, THROUGH THE LIFTING RING FROM THE BOTTOM UP, BACK OVER TOP OF NEAR CONTAINER AND BACK DOWN AND ATTACH THE FORWARD STRAP HOOK TO THE THIRD TIEDOWN ANCHOR FROM THE FORWARD END OF THE CARGO DECK AND ATTACH THE AFT STRAP HOOK TO THE FOURTH TIEDOWN ANCHOR FROM THE AFT END OF THE CARGO DECK. POSITION STRAP SCUFF SLEEVES AT SHARP EDGES. TAKE UP EXCESS SLACK IN STRAP AND RATCHET TIGHT. SEE GENERAL NOTES "D" AND "E", ON PAGE 2.

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
CONTAINER	2	10,156 LBS



ISOMETRIC VIEW

SPECIAL NOTES:

1. A LOAD OF ONE CONTAINER IS SHOWN IN AN 11-TON M989 HEAVY EXPANDED MOBILITY AMMUNITION TRAILER, HAVING INSIDE DIMENSIONS OF 208" LONG BY 92-9/16" WIDE, EQUIPPED WITH "SHOE" TYPE RESTRAINING DEVICES AS SHOWN ON PAGE 28.
2. CAUTION: CONTAINERS MUST NOT BE POSITIONED TWO HIGH ON THIS TYPE TRAILER DUE TO THE STABILITY OF THE TRAILER.
3. IF THE 11-TON M989 HEMAT IS NOT EQUIPPED WITH THE "SHOE" TYPE RESTRAINING DEVICES USE THE PROCEDURES SHOWN ON PAGE 6 FOR LOADING AND TIEDOWN OF ONE CONTAINER.
4. A TOTAL OF FOUR WEB STRAP TIEDOWN ASSEMBLIES ARE REQUIRED FOR THE LOAD SHOWN ABOVE.

KEY NUMBERS

① SHOE ASSEMBLY (4 REQD). SEE THE DETAIL ON PAGE 28. PRE-POSITION EACH SHOE ASSEMBLY AS SHOWN IN THE "PLAN VIEW OF 11-TON M989 HEMAT" DETAIL ON PAGE 28. SEE LOADING PROCEDURE NOTE 7 ON PAGE 14.

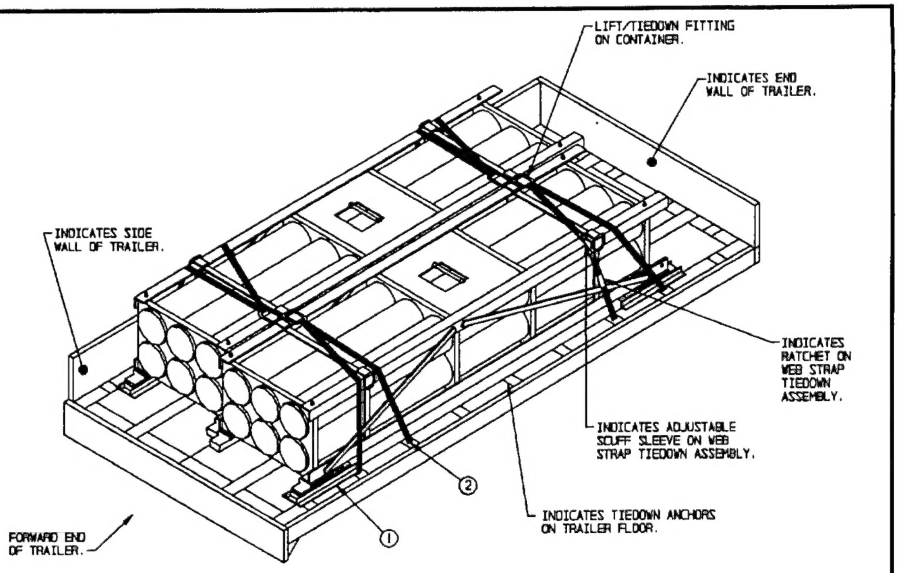
② WEB STRAP TIEDOWN ASSEMBLY (4 REQD). HOOK THE END OF THE STRAP THAT HAS THE RATCHET TO THE SECOND TIEDOWN ANCHOR FROM END OF TRAILER, THEN THE HOOK ON THE LONG END OF THE STRAP ASSEMBLY IS PASSED UPWARD TO A LIFT/TIEDOWN FITTING ON THE CONTAINER, THROUGH THE LIFTING RING FROM THE BOTTOM UP, BACK DOWN AND ATTACH THE HOOK TO THE THIRD TIEDOWN ANCHOR FROM THE END OF TRAILER. POSITION STRAP SCUFF SLEEVES AT SHARP EDGES. TAKE UP EXCESS SLACK IN STRAP AND RATCHET TIGHT. SEE GENERAL NOTES "D" AND "E" ON PAGE 2

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
CONTAINER	1	5,078 LBS

11-TON M989 HEAVY EXPANDED MOBILITY AMMUNITION TRAILER (HEMAT) PAGE 19

PROJECT GM 725-80



ISOMETRIC VIEW

SPECIAL NOTES:

1. A LOAD OF TWO CONTAINERS IS SHOWN IN AN 11-TON M989 HEAVY EXPANDED MOBILITY AMMUNITION TRAILER, HAVING INSIDE DIMENSIONS OF 20'8" LONG BY 82-9/16" WIDE, EQUIPPED WITH "SHOE" TYPE RESTRAINING DEVICES AS SHOWN ON PAGE 26.
2. CAUTION: CONTAINERS MUST NOT BE POSITIONED TWO HIGH ON THIS TYPE TRAILER DUE TO THE STABILITY OF THE TRAILER.
3. IF THE 11-TON M989 HEMAT IS NOT EQUIPPED WITH THE "SHOE" TYPE RESTRAINING DEVICES USE THE PROCEDURES SHOWN ON PAGE 8 FOR LOADING AND TIEDOWN OF TWO CONTAINERS.
4. WHEN POSITIONING CONTAINERS ON VEHICLES ASSURE THAT LIFTING RINGS ON CONTAINERS ARE OFF-SET LONGITUDINALLY AND RESTING ON TOP OF ADJACENT CONTAINER.
5. A TOTAL OF FOUR WEB STRAP TIEDOWN ASSEMBLIES ARE REQUIRED FOR THE LOAD SHOWN ABOVE.

KEY NUMBERS

① SHOE ASSEMBLY (4 REQD). SEE THE DETAIL ON PAGE 26. PRE-POSITION EACH SHOE ASSEMBLY AS SHOWN IN THE "PLAN VIEW OF 11-TON M989 HEMAT" DETAIL ON PAGE 28. SEE LOADING PROCEDURES NOTE 7 ON PAGE 14.

② WEB STRAP TIEDOWN ASSEMBLY (4 REQD). HOOK THE END OF THE STRAP THAT HAS THE RATCHET TO THE SECOND TIEDOWN ANCHOR FROM END OF TRAILER. THEN THE HOOK ON THE LONG END OF THE STRAP ASSEMBLY IS PASSED UPWARD AND OVER THE TOP OF THE NEAR-SIDE CONTAINER TO A LIFT/TIEDOWN FITTING ON THE CONTAINER THAT IS LOCATED ON THE OPPOSITE SIDE OF THE TRUCK, THROUGH THE LIFTING RING FROM THE BOTTOM UP, BACK DOWN AND ATTACH THE HOOK TO THE THIRD TIEDOWN ANCHOR FROM END OF TRAILER. POSITION STRAP SCUFF SLEEVES AT SHARP EDGES. TAKE UP EXCESS SLACK IN STRAP AND RATCHET TIGHT. SEE GENERAL NOTES "D" AND "E" ON PAGE 2.

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
CONTAINER	2	10,158 LBS

11-TON M989 HEAVY EXPANDED MOBITITY AMMUNITION TRAILER (HEMAT)

PROJECT GM 725-80